

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: DAWN GARRETT Examiner #: 76157 Date: 8/8/2001
 Art Unit: 1774 Phone Number 305-0788 Serial Number: 09/547 415
 Mail Box and Bldg/Room Location: Mailbox 11D03 Results Format Preferred (circle): PAPER DISK E-MAIL

Crystal Plaza 3 Room# 11D30

If more than one search is submitted, please prioritize searches in order of need.

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Full color display structures using pseudomorphic cladding quantum dot nanophosphor thin films

Inventors (please provide full names):

Faquir C. Jain and Fotios Papadimitrakopoulos

Earliest Priority Filing Date: 4/11/2000

For Sequence Searches Only Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

*Please search claim 1 (attached)
 And the specific layers of claims 3 and 5*

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NOTE:

If you need speak to me regarding the search, feel free to give me a call.

Thank

208

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Staff Use Only	Type of Search	Vendors and cost where applicable
Searcher: <u>JDH</u>	NA Sequence (#) _____	STN <input checked="" type="checkbox"/>
Searcher Phone #: <u>X-4139</u>	AA Sequence (#) _____	Dialog _____
Searcher Location: <u>21C 1700</u>	Structure (#) <u>Reg #2</u>	Questel/Orbit _____
Date Searcher Picked Up: _____	Bibliographic <input checked="" type="checkbox"/>	Dr.Link _____
Date Completed: <u>8-13-01</u>	Litigation _____	Lexis/Nexis _____
Searcher Prep & Review Time: <u>45</u>	Fulltext _____	Sequence Systems _____
Clerical Prep Time: <u>12</u>	Patent Family _____	WWW/Internet _____
Online Time: <u>75</u>	Other _____	Other (specify) _____

L7	1120	SEA FILE=REGISTRY ABB=ON	PLU=ON	(ZN(L)SE)/ELS AND (CD OR MG OR BE OR S) (L) 3-7/ELC.SUB
L9	779	SEA FILE=REGISTRY ABB=ON	PLU=ON	(GA(L)N)/ELS AND (IN OR AL) AND 2-8/ELC.SUB
L13	18531	SEA FILE=REGISTRY ABB=ON	PLU=ON	ZN(L) (S OR SE OR MG OR CD OR BE)/ELS AND 3-6/ELC.SUB
L14	9750	SEA FILE=REGISTRY ABB=ON	PLU=ON	ZN(L) (S OR SE OR MG OR CD OR BE)/ELS AND 3-4/ELC.SUB
L16	3094	SEA FILE=REGISTRY ABB=ON	PLU=ON	L14 AND (SE OR S)/ELS
L19	64	SEA FILE=REGISTRY ABB=ON	PLU=ON	(AL(L)IN(L)N)/ELS AND 3/ELC
L20	4515	SEA FILE=HCAPLUS ABB=ON	PLU=ON	(ELECTROLUMIN? OR EL) (L) SEMICONDUCT?
L22	8916	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L7 OR L9
L23	29111	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L13
L24	15460	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L16 OR L19
L26	249	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L20 AND INSULATOR?
L27	13	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L26 AND (L22 OR L23 OR L24)

L27 ANSWER 1 OF 13 HCAPLUS COPYRIGHT 2001 ACS
 AN 2000:824580 HCAPLUS
 DN 134:11540
 TI Electroluminescent laminate with patterned phosphor structure and thick film dielectric with improved dielectric properties
 IN Wu, Xingwei; Seale, Daniel Joseph; Liu, Guo; Carkner, Donald Edward; Dorse, Daniel; Kupsky, George A.; Westcott, Michael Roger; Lovell, David Robin
 PA Ifire Technology Inc., Can.
 SO PCT Int. Appl., 95 pp.
 CODEN: PIXXD2
 DT Patent
 LA English
 IC ICM H05B033-14
 ICS H05B033-12; H05B033-10; H05B033-22
 CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
 Section cross-reference(s): 49, 73, 76

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000070917	A1	20001123	WO 2000-CA561	20000512
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
PRAI US 1999-134299	P	19990514		
US 2000-540288	A	20000331		

AB Patterned phosphor structure having red, green, and blue sub-pixel phosphor elements for a.c. electroluminescent displays are described which comprise at least a first and a second phosphor, each emitting light in different ranges of the visible spectrum, but whose combined emission spectra contains red, green, and blue light in a layer, arranged in adjacent repeating relationship to each other to provide a plurality of repeating phosphor deposits; and .gtoreq.1 means assocd. with .gtoreq.1 of the phosphor deposits, and which, together with the at least first and second phosphor deposits, form the sub-pixel phosphor elements, for setting and equalizing the threshold voltages of the sub-pixel phosphor elements, and for setting the relative luminosities of the sub-pixel phosphor elements so that they bear set ratios to one another at each operating modulation voltage used to generate the desired luminosities for red, green, and blue. Methods for forming the structures are described which entail selecting the phosphors; depositing and patterning the phosphor layer, providing the means for setting and equalizing the threshold voltages of the phosphors to form the sub-pixel elements, and, optionally, annealing the structure. Electroluminescent laminates comprising the patterned phosphor structures formed on a rigid substrate over a thick film dielec. layer formed from a sintered ceramic material having a dielec. const. >500, and having a thickness .gtorsim.10 .mu.m and, optionally, optical color filter means aligned with the sub-pixel elements are also described. Methods of forming the thick film dielec. layers for electroluminescent laminates are also described which entail depositing a ceramic material in .gtoreq.1 layers by a thick film technique to form a dielec. layer having a thickness of 10-300 .mu.m;

pressing the dielec. layer to form a densified layer with reduced porosity and surface roughness; and sintering the dielec. layer to form a pressed sintered dielec. layer which, in the laminates, has an improved uniform luminosity over an unpressed sintered dielec. layer of the same compn. Substrate/dielec. layer components for use in electroluminescent laminates comprising a substrate which provides a rear electrode and a densified ceramic thick film dielec. layer are also described. Methods of synthesizing strontium sulfide are described which entail providing a source of high purity strontium carbonate in a dispersed form; heating the strontium carbonate in a reactor with gradual heating up to a max. temp. of 800-1200.degree.; contacting the heated strontium carbonate with a flow of sulfur vapors formed by heating elemental sulfur in the reactor to .gtoreq.300.degree. in an inert atm.; and terminating the reaction by stopping the flow of sulfur at a point when sulfur dioxide or carbon dioxide in the reaction gas reaches an amt. which correlates with an amt. of oxygen in oxygen-contg. strontium compds. in the reaction product, which is in the range of 1-10 at.%. .

- ST electroluminescent laminate patterned phosphor structure; thick film densified dielec layer electroluminescent laminate; strontium sulfide prodn
- IT Electric **insulators**
 (ceramic; electroluminescent laminates with patterned phosphor structures and thick film densified dielec. layers and their prodn. and strontium sulfide synthesis)
- IT Electroluminescent devices
 Optical imaging devices
Semiconductor device fabrication
 (electroluminescent laminates with patterned phosphor structures and thick film densified dielec. layers and their prodn. and strontium sulfide synthesis)
- IT Phosphors
 (electroluminescent; electroluminescent laminates with patterned phosphor structures and thick film densified dielec. layers and their prodn. and strontium sulfide synthesis)
- IT Photolithography
 (in patterned phosphor structure prodn. for electroluminescent laminates)
- IT Molding of ceramics
 (in thick film densified dielec. layers prodn.)
- IT 50926-11-9, Indium tin oxide
 RL: DEV (Device component use); USES (Uses)
 (electroluminescent laminates with patterned phosphor structures and thick film densified dielec. layers and their prodn. and strontium sulfide synthesis)
- IT 1314-96-1P, Strontium sulfide
 RL: DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process); USES (Uses)
 (electroluminescent laminates with patterned phosphor structures and thick film densified dielec. layers and their prodn. and strontium sulfide synthesis)
- IT 7439-96-5, Manganese, processes 7440-45-1, Cerium, processes
 7723-14-0, Phosphorus, processes
 RL: DEV (Device component use); MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (electroluminescent laminates with patterned phosphor structures and thick film densified dielec. layers and their prodn. and strontium sulfide synthesis)
- IT 1314-61-0, Tantalum oxide 1314-98-3, Zinc sulfide, processes
 1344-28-1, Alumina, processes 7631-86-9, Silica, processes 11105-01-4,

Silicon oxynitride 12047-27-7, Barium titanate, processes 12055-23-1, Hafnia 12060-00-3, Lead titanate 12676-60-7, Lanthanum lead titanium zirconium oxide ((La,Pb)(Ti,Zr)O₃) 37349-19-2, Lead magnesium niobate 65430-80-0, Lead magnesium niobium titanium oxide 152060-61-2, Lead zirconium titanate 176046-26-7, Zinc magnesium sulfide (Zn_{0.7}Mg_{0.3}S)

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(electroluminescent laminates with patterned phosphor structures and thick film densified dielec. layers and their prodn. and strontium sulfide synthesis)

IT 67-56-1, Methanol, processes 108-88-3, Toluene, processes 7647-01-0, Hydrochloric acid, processes 7664-38-2, Phosphoric acid, processes

RL: NUU (Nonbiological use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(in patterned phosphor structure prodn. for electroluminescent laminates)

IT 124-38-9P, Carbon dioxide, preparation 7446-09-5P, Sulfur dioxide, preparation

RL: BYP (Byproduct); NUU (Nonbiological use, unclassified); PREP (Preparation); USES (Uses)

(in strontium sulfide synthesis)

IT 1633-05-2, Strontium carbonate 7704-34-9, Sulfur, reactions

RL: RCT (Reactant)

(in strontium sulfide synthesis)

RE.CNT 2

RE

(1) Inoguchi, K; US 5932327 A 1999 HCAPLUS

(2) Okamoto, F; JOURNAL OF THE ELECTROCHEMICAL SOCIETY 1983, V130(2), P432 HCAPLUS

IT 176046-26-7, Zinc magnesium sulfide (Zn_{0.7}Mg_{0.3}S)

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(electroluminescent laminates with patterned phosphor structures and thick film densified dielec. layers and their prodn. and strontium sulfide synthesis)

RN 176046-26-7 HCAPLUS

CN Magnesium zinc sulfide (Mg_{0.3}Zn_{0.7}S) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	1	7704-34-9
Zn	0.7	7440-66-6
Mg	0.3	7439-95-4

L27 ANSWER 2 OF 13 HCAPLUS COPYRIGHT 2001 ACS

AN 2000:274799 HCAPLUS

DN 132:300752

TI LED

IN Okuyama, Hiroyuki; Kishima, Satoru

PA Sony Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01L033-00

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000124501	A2	20000428	JP 1998-291834	19981014
AB	The LED comprises: (1) an In n electrode layer; (2) an n-GaAs substrate; and (3) an n-GaAs 1st buffer, (4) an n-GaAs 2nd buffer, (5) an n-GaAs 3rd buffer, (6) an n-ZnMgSSe cladding, (7) an n-ZnSSe guide, (8) a ZnCdSe active, (9) a p-ZnSSe guide. (10) a p-ZnMgSSe cladding, (11) a p-ZnSSe auxiliary cladding, (12) a SiO ₂ insulator, (13) a p-ZnSe intermediate, (14) a p-ZnSe/p-ZnTe superlattice, (15) a p-ZnTe contact, and (16) a Au p electrode layer, where (12) divides (13)-(16) into 4 segments (each segment < 1-3 x 10 ⁴ .mu.m ²) via dividing paths > 10 .mu.m wide; and (6), (8) and (10) comprise Group II-VI compds. doped with .gtoreq.1 selected from Be, Zn, Hg, Cd, Mg and .gtoreq.1 selected from O, S, Se, Te.				
ST	gallium arsenide zinc magnesium sulfide selenide LED				
IT	Semiconductor electroluminescent devices Semiconductor superlattices (LED comprising GaAs, ZnS, ZnSe, ZnTe, ZnSSe and ZnMgSSe)				
IT	Group IIB element chalcogenides RL: DEV (Device component use); USES (Uses) (LED comprising GaAs, ZnS, ZnSe, ZnTe, ZnSSe and ZnMgSSe)				
IT	1303-00-0, Gallium arsenide (GaAs), uses 1315-09-9, Zinc selenide (ZnSe) 1315-11-3, Zinc telluride (ZnTe) 7440-57-5, Gold, uses 7440-74-6, Indium, uses 7631-86-9, Silica, uses 59989-74-1 , Zinc selenide sulfide (Zn(Se,S)) 107874-73-7 , Cadmium zinc selenide (CdZnSe) 113937-99-8 , Zinc selenide sulfide (ZnSe _{0.94} S _{0.06}) 189562-20-7 , Magnesium zinc selenide sulfide (Mg _{0.12} Zn _{0.88} Se _{0.82} S _{0.18}) 264194-78-7 , Magnesium zinc selenide sulfide (Mg _{0.25} Zn _{0.75} Se _{0.72} S _{0.28}) RL: DEV (Device component use); USES (Uses) (LED comprising GaAs, ZnS, ZnSe, ZnTe, ZnSSe and ZnMgSSe)				
IT	7439-95-4, Magnesium, uses 7439-97-6, Mercury, uses 7440-41-7, Beryllium, uses 7440-43-9, Cadmium, uses 7440-66-6, Zinc, uses 7704-34-9, Sulfur, uses 7782-44-7, Oxygen, uses 7782-49-2, Selenium, uses 13494-80-9, Tellurium, uses RL: MOA (Modifier or additive use); USES (Uses) (LED comprising GaAs, ZnS, ZnSe, ZnTe, ZnSSe and ZnMgSSe)				
IT	59989-74-1 , Zinc selenide sulfide (Zn(Se,S)) 107874-73-7 , Cadmium zinc selenide (CdZnSe) 113937-99-8 , Zinc selenide sulfide (ZnSe _{0.94} S _{0.06}) 189562-20-7 , Magnesium zinc selenide sulfide (Mg _{0.12} Zn _{0.88} Se _{0.82} S _{0.18}) 264194-78-7 , Magnesium zinc selenide sulfide (Mg _{0.25} Zn _{0.75} Se _{0.72} S _{0.28}) RL: DEV (Device component use); USES (Uses) (LED comprising GaAs, ZnS, ZnSe, ZnTe, ZnSSe and ZnMgSSe)				
RN	59989-74-1 HCAPLUS				
CN	Zinc selenide sulfide (Zn(Se,S)) (9CI) (CA INDEX NAME)				

Component	Ratio	Component
		Registry Number
Se	0 - 1	7782-49-2
S	0 - 1	7704-34-9
Zn	1	7440-66-6

RN 107874-73-7 HCAPLUS

CN Cadmium zinc selenide ((Cd,Zn)Se) (9CI) (CA INDEX NAME)

Component	Ratio	Component
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		Registry Number
Se	1	7782-49-2
Zn	0 - 1	7440-66-6
Cd	0 - 1	7440-43-9

RN 113937-99-8 HCAPLUS

CN Zinc selenide sulfide (ZnSe_{0.94}S_{0.06}) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Se	0.94	7782-49-2
S	0.06	7704-34-9
Zn	1	7440-66-6

RN 189562-20-7 HCAPLUS

CN Magnesium zinc selenide sulfide (Mg_{0.12}Zn_{0.88}Se_{0.82}S_{0.18}) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Se	0.82	7782-49-2
S	0.18	7704-34-9
Zn	0.88	7440-66-6
Mg	0.12	7439-95-4

RN 264194-78-7 HCAPLUS

CN Magnesium zinc selenide sulfide (Mg_{0.25}Zn_{0.75}Se_{0.72}S_{0.28}) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Se	0.72	7782-49-2
S	0.28	7704-34-9
Zn	0.75	7440-66-6
Mg	0.25	7439-95-4

L27 ANSWER 3 OF 13 HCAPLUS COPYRIGHT 2001 ACS

AN 2000:130346 HCAPLUS

DN 132:173196

TI GaN semiconductor light-emitting device

IN Monden, Michio

PA Murata Mfg. Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01L033-00

ICS H01S005-30

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000058918	A2	20000225	JP 1998-225063	19980807

AB The invention relates to a GaN-base semiconductor light-emitting device

that comprises $\text{In}_x\text{Ga}_y\text{Al}_z\text{N}$ ($x+y+z = 1$, $0.1 \leq x \leq 1$, $0.1 \leq y \leq 1$, and $0.1 \leq z \leq 1$) layers stacked on an **insulator** substrate having a metal film fabricated on the substrate surface in a specific pattern, such as a digitated shape.

ST aluminum gallium indium nitride LED laser

IT **Electroluminescent** devices
Semiconductor lasers

(GaN **semiconductor** light-emitting device)

IT 1314-13-2, Zinc oxide, uses 25617-97-4, Gallium nitride

106097-44-3, Aluminum gallium nitride ((Al,Ga)N)

RL: DEV (Device component use); USES (Uses)

(GaN semiconductor light-emitting device)

IT **106097-44-3**, Aluminum gallium nitride ((Al,Ga)N)

RL: DEV (Device component use); USES (Uses)

(GaN semiconductor light-emitting device)

RN 106097-44-3 HCAPLUS

CN Aluminum gallium nitride ((Al,Ga)N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	1	17778-88-0
Ga	0 - 1	7440-55-3
Al	0 - 1	7429-90-5

L27 ANSWER 4 OF 13 HCAPLUS COPYRIGHT 2001 ACS

AN 2000:116445 HCAPLUS

DN 132:158773

TI Organic electroluminescent device

IN Hosokawa, Chishio; Kusumoto, Tadashi

PA Idemitsu Kosan Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H05B033-28

ICS H05B033-14; H05B033-22

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	-----	-----	-----	-----
PI JP 2000048966	A2	20000218	JP 1998-210877	19980727

AB An org. **electroluminescent** device comprises an org. layer(s) placed between a transparent electrode and a counter electrode. The transparent electrode comprises a metal thin film and either a **semiconductor** or **insulator** film in which the carrier concn. is $< 10^{23} \text{ cm}^{-3}$, and the energy gap is $\geq 2.7 \text{ eV}$, wherein the **semiconductor** or **insulator** film is in contact with the org. layer for reducing the surface resistance of the transparent electrode.

ST org electroluminescent device transparent electrode

IT Electroluminescent devices

(org. electroluminescent device)

IT Electric contacts

(transparent electrode; org. electroluminescent device)

IT 1315-09-9, Zinc selenide 2085-33-8, Al 8q 7440-22-4, Silver, uses

7783-40-6, Magnesium fluoride 7789-24-4, Lithium fluoride, uses

12798-95-7 13463-67-7, Titanium oxide, uses **246858-96-8**,

Indium magnesium zinc oxide 246860-64-0, Indium ytterbium zinc oxide
 RL: DEV (Device component use); USES (Uses)
 (org. electroluminescent device)
 IT 246858-96-8, Indium magnesium zinc oxide
 RL: DEV (Device component use); USES (Uses)
 (org. electroluminescent device)
 RN 246858-96-8 HCAPLUS
 CN Indium magnesium zinc oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
In	x	7440-74-6
Zn	x	7440-66-6
Mg	x	7439-95-4

L27 ANSWER 5 OF 13 HCAPLUS COPYRIGHT 2001 ACS
 AN 1999:690393 HCAPLUS
 DN 131:293140
 TI Semiconductor LED devices
 IN Kamikawa, Takeshi; Ito, Shigetoshi
 PA Sharp Corp., Japan
 SO Jpn. Kokai Tokkyo Koho, 5 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM H01L033-00
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11298040	A2	19991029	JP 1998-98839	19980410
AB	The LED comprises: a sapphire substrate; an n-GaN buffer layer; an n-GaN contact layer with n shoulder electrode; and an n-AlGaIn cladding, a GaInN active, a p-AlGaIn vaporization preventive, a p-AlGaIn cladding, a p-GaN cap, a Ni (or Pd), a conductive and a Au p electrode layer, where the conductive layer comprises Pt, W, WN, V, Mo or Ta; an O-contg. dielec. layer is formed thereon, and the laminate is heat-treated at 400-800.degree..				
ST	gallium indium nitride LED nickel molybdenum; aluminum gallium nitride LED nickel molybdenum				
IT	Electric insulators Semiconductor electroluminescent devices (semiconductor LED devices)				
IT	1317-82-4, Sapphire (Al ₂ O ₃) 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-25-7, Tantalum, uses 7440-33-7, Tungsten, uses 7440-62-2, Vanadium, uses 7631-86-9, Silica, uses 12033-89-5, Silicon nitride, uses 12058-38-7, Tungsten nitride (WN) 25617-97-4, Gallium nitride (GaN) 106097-44-3, Aluminum gallium nitride (AlGaIn) 110759-40-5, Aluminum gallium nitride al _{0.1} ga _{0.9} n 120994-23-2, Gallium indium nitride (GaInN) 124088-93-3, Gallium indium nitride ga _{0.8} in _{0.2} n 168269-92-9, Aluminum gallium nitride al _{0.05} ga _{0.95} n RL: DEV (Device component use); USES (Uses) (semiconductor LED devices)				
IT	106097-44-3, Aluminum gallium nitride (AlGaIn) 110759-40-5				

, Aluminum gallium nitride $\text{Al}_{0.1}\text{Ga}_{0.9}\text{N}$ **120994-23-2**, Gallium indium nitride (GaInN) **124088-93-3**, Gallium indium nitride $\text{Ga}_{0.8}\text{In}_{0.2}\text{N}$ **168269-92-9**, Aluminum gallium nitride $\text{Al}_{0.05}\text{Ga}_{0.95}\text{N}$
 RL: DEV (Device component use); USES (Uses)
 (semiconductor LED devices)

RN 106097-44-3 HCAPLUS

CN Aluminum gallium nitride ($(\text{Al},\text{Ga})\text{N}$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
Ga	0 - 1	7440-55-3
Al	0 - 1	7429-90-5

RN 110759-40-5 HCAPLUS

CN Aluminum gallium nitride ($\text{Al}_{0.1}\text{Ga}_{0.9}\text{N}$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
Ga	0.9	7440-55-3
Al	0.1	7429-90-5

RN 120994-23-2 HCAPLUS

CN Gallium indium nitride ($(\text{Ga},\text{In})\text{N}$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
In	0 - 1	7440-74-6
Ga	0 - 1	7440-55-3

RN 124088-93-3 HCAPLUS

CN Gallium indium nitride ($\text{Ga}_{0.8}\text{In}_{0.2}\text{N}$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
In	0.2	7440-74-6
Ga	0.8	7440-55-3

RN 168269-92-9 HCAPLUS

CN Aluminum gallium nitride ($\text{Al}_{0.05}\text{Ga}_{0.95}\text{N}$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
Ga	0.95	7440-55-3
Al	0.05	7429-90-5

L27 ANSWER 6 OF 13 HCAPLUS COPYRIGHT 2001 ACS

AN 1999:439979 HCAPLUS

DN 131:108742

TI Gallium nitride-type semiconductor light-emitting devices

IN Oku, Yasushige; Kamei, Hidenori
 PA Matsushita Electric Industrial Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 7 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM H01L033-00
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
 Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11191635	A2	19990713	JP 1997-359616	19971226
AB	The devices comprise: an insulator substrate; an n-layer; an active layer; and a p-layer; where the n-layer has at least two parts; the first layer has a thickness of 1 - 5 .mu.m and a carrier d. of $1 \times 10^{16} - 2 \times 10^{18} \text{ cm}^{-3}$; the second layer has a thickness of 0.1 - 0.5 .mu.m and a carrier d. of $2 \times 10^{18} - 1 \times 10^{19} \text{ cm}^{-3}$; and a side n-electrode is formed on the second n-layer.				
ST	gallium nitride semiconductor LED laser diode; indium gallium nitride LED laser; aluminum gallium nitride LED laser				
IT	Electron density				
	Semiconductor electroluminescent devices				
	Semiconductor lasers				
	(gallium nitride-type semiconductor light-emitting devices)				
IT	1317-82-4, Sapphire	7429-90-5, Aluminum, uses	7440-02-0, Nickel, uses	7440-57-5, Gold, uses	7631-86-9, Silica, uses
	25617-97-4, Gallium nitride	37382-15-3, Aluminum gallium arsenide ((Al,Ga)As)	120994-23-2, Indium gallium nitride		
	RL: DEV (Device component use); USES (Uses)				
	(gallium nitride-type semiconductor light-emitting devices)				
IT	7439-95-4, Magnesium, uses	7440-21-3, Silicon, uses			
	RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)				
	(gallium nitride-type semiconductor light-emitting devices)				
IT	120994-23-2, Indium gallium nitride				
	RL: DEV (Device component use); USES (Uses)				
	(gallium nitride-type semiconductor light-emitting devices)				
RN	120994-23-2 HCAPLUS				
CN	Gallium indium nitride ((Ga,In)N) (9CI) (CA INDEX NAME)				

Component	Ratio	Component Registry Number
N	1	17778-88-0
In	0 - 1	7440-74-6
Ga	0 - 1	7440-55-3

L27 ANSWER 7 OF 13 HCAPLUS COPYRIGHT 2001 ACS
 AN 1999:344737 HCAPLUS
 DN 131:25589
 TI Gallium nitride-type semiconductor light-emitting device and light-accepting device
 IN Toyota, Tatsunori; Kususe, Takeshi; Shono, Hirofumi
 PA Nichia Chemical Industries Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 7 pp.
 CODEN: JKXXAF
 DT Patent

LA Japanese
 IC ICM H01L033-00
 ICS H01L031-10; H01S003-18
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
 Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11150298	A2	19990602	JP 1997-331012	19971114
AB	The light-emitting device has a substrate, a n-type GaN-based semiconductor layer on the substrate, a light-emitting layer on the n-type semiconductor layer, a p-type GaN-type semiconductor layer on the light-emitting layer, a n-side electrode formed on an exposed portion at the center of the n-type semiconductor layer, and a p-side electrode placed on the p-type semiconductor so that it surrounds the n-side electrode. The device is characterized by that light leak from a space between the 2 electrodes is avoided because a continuous elec. insulator film is formed from the sidewall of the p-type semiconductor to the inner periphery of the p-side electrode and the n-side electrode is extended over the inner periphery of the p-side electrode through the elec. insulator film. The light-accepting device has the same structure.				
ST	gallium nitride semiconductor light emitting device; light accepting device gallium nitride semiconductor; leak light prevention electroluminescent device				
IT	Semiconductor electroluminescent devices (gallium nitride-type semiconductor light-emitting device and light-accepting device showing prevention of leak of light from semiconductor side)				
IT	Electric insulators (intermediate film of specified structure; in gallium nitride-type semiconductor light-emitting device and light-accepting device showing prevention of leak of light from semiconductor side)				
IT	Electrodes (of specified structure; in gallium nitride-type semiconductor light-emitting device and light-accepting device showing prevention of leak of light from semiconductor side)				
IT	7439-95-4, Magnesium, uses 7440-21-3, Silicon, uses RL: MOA (Modifier or additive use); USES (Uses) (dopant; in gallium nitride-type semiconductor light-emitting device and light-accepting device showing prevention of leak of light from semiconductor side)				
IT	106097-44-3, Aluminum gallium nitride ((Al,Ga)N) 127575-65-9, Aluminum indium gallium nitride RL: DEV (Device component use); USES (Uses) (gallium nitride-type semiconductor light-emitting device and light-accepting device showing prevention of leak of light from semiconductor side)				
IT	106097-44-3, Aluminum gallium nitride ((Al,Ga)N) 127575-65-9, Aluminum indium gallium nitride RL: DEV (Device component use); USES (Uses) (gallium nitride-type semiconductor light-emitting device and light-accepting device showing prevention of leak of light from semiconductor side)				
RN	106097-44-3 HCAPLUS				
CN	Aluminum gallium nitride ((Al,Ga)N) (9CI) (CA INDEX NAME)				

Component	Ratio	Component	Registry Number

N	1	17778-88-0
Ga	0 - 1	7440-55-3
Al	0 - 1	7429-90-5

RN 127575-65-9 HCAPLUS

CN Aluminum gallium indium nitride ((Al,Ga,In)N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
In	0 - 1	7440-74-6
Ga	0 - 1	7440-55-3
Al	0 - 1	7429-90-5

L27 ANSWER 8 OF 13 HCAPLUS COPYRIGHT 2001 ACS

AN 1998:428084 HCAPLUS

DN 129:143697

TI Manufacture of nitride semiconductor devices

IN Sakamoto, Keiji; Nakamura, Shuji

PA Nichia Chemical Industries Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01S003-18

ICS H01L033-00; H01L021-02

CC 76-2 (Electric Phenomena)

Section cross-reference(s): 75

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10178239	A2	19980630	JP 1996-336694	19961217
AB	N-type nitride semiconductor layers, .gtoreq.6-.mu.m thick, are grown on insulator substrates across .ltoreq.0.5-.mu.m-thick buffer layers, after growing further nitride layers, the thickness of the substrates is adjusted to .ltoreq.60 .mu.m, and the wafers (the substrates and nitride layers) are cut into chips.				
ST	nitride semiconductor device manuf wafer thickness; crystal growth nitride semiconductor device manuf				
IT	Crystal growth				
	Electroluminescent devices				
	Semiconductor device fabrication				
	(manuf. of nitride semiconductor devices)				
IT	Nitrides				
	RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)				
	(manuf. of nitride semiconductor devices)				
IT	25617-97-4P, Gallium nitride (GaN) 110759-40-5P , Aluminum gallium nitride (Al0.1Ga0.9N) 125297-45-2P , Aluminum gallium nitride (Al0.2Ga0.8N) 132238-81-4P , Gallium indium nitride (Ga0.9In0.1N)				
	RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)				
	(manuf. of nitride semiconductor devices)				
IT	110759-40-5P , Aluminum gallium nitride (Al0.1Ga0.9N)				
	125297-45-2P , Aluminum gallium nitride (Al0.2Ga0.8N)				
	132238-81-4P , Gallium indium nitride (Ga0.9In0.1N)				

RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(manuf. of nitride semiconductor devices)

RN 110759-40-5 HCAPLUS

CN Aluminum gallium nitride (Al_{0.1}Ga_{0.9}N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
Ga	0.9	7440-55-3
Al	0.1	7429-90-5

RN 125297-45-2 HCAPLUS

CN Aluminum gallium nitride (Al_{0.2}Ga_{0.8}N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
Ga	0.8	7440-55-3
Al	0.2	7429-90-5

RN 132238-81-4 HCAPLUS

CN Gallium indium nitride (Ga_{0.9}In_{0.1}N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
In	0.1	7440-74-6
Ga	0.9	7440-55-3

L27 ANSWER 9 OF 13 HCAPLUS COPYRIGHT 2001 ACS

AN 1995:986945 HCAPLUS

DN 124:101423

TI Group IIIA element nitride **semiconductor**
electroluminescent device and its manufacture

IN Koike, Masayoshi; Shibata, Naoki; Yamazaki, Shiro

PA Toyoda Gosei Kk, Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01L033-00

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 07263748	A2	19951013	JP 1994-76513	19940322
	US 5700713	A	19971223	US 1995-406415	19950320
PRAI	JP 1994-76513		19940322		

AB The device comprises: n- and i-type layers consisting of Group IIIA element nitride semiconductor; and an insulation film partially covering the i-type layer, wherein the the heat treatment of the i-type layer in a N₂ atmosphere produces a p-type region in the i-type layer not covered by the insulation film.

ST Group IIIA nitride **electroluminescent** device;
semiconductor nitride **electroluminescent** device;
nitrogen heating **semiconductor electroluminescent**
device

IT **Electroluminescent** devices
Semiconductor materials
(Group IIIA element nitride **semiconductor**
electroluminescent device produced by heat treatment in
nitrogen)

IT 7439-95-4, Magnesium, uses 7440-21-3, Silicon, uses 7440-43-9,
Cadmium, uses 7440-66-6, Zinc, uses
RL: DEV (Device component use); MOA (Modifier or additive use); PEP
(Physical, engineering or chemical process); PROC (Process); USES (Uses)
(Group IIIA element nitride **semiconductor**
electroluminescent device produced by heat treatment in
nitrogen)

IT 25617-97-4, Gallium nitride **169821-55-0**, Aluminum gallium indium
nitride (Al_{0.28}Ga_{0.66}In_{0.06}N) **169821-56-1**, Aluminum gallium
indium nitride (Al_{0.09}Ga_{0.9}In_{0.01}N)
RL: DEV (Device component use); PEP (Physical, engineering or chemical
process); PROC (Process); USES (Uses)
(Group IIIA element nitride **semiconductor**
electroluminescent device produced by heat treatment in
nitrogen)

IT 7727-37-9, Nitrogen, uses
RL: NUU (Nonbiological use, unclassified); USES (Uses)
(Group IIIA element nitride **semiconductor**
electroluminescent device produced by heat treatment in
nitrogen)

IT 12033-89-5, Silicon nitride, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical
process); PROC (Process); USES (Uses)
(elec. **insulator**; Group IIIA element nitride
semiconductor electroluminescent device produced by
heat treatment in nitrogen)

IT **169821-55-0**, Aluminum gallium indium nitride (Al_{0.28}Ga_{0.66}In_{0.06}N)
169821-56-1, Aluminum gallium indium nitride (Al_{0.09}Ga_{0.9}In_{0.01}N)
RL: DEV (Device component use); PEP (Physical, engineering or chemical
process); PROC (Process); USES (Uses)
(Group IIIA element nitride **semiconductor**
electroluminescent device produced by heat treatment in
nitrogen)

RN 169821-55-0 HCAPLUS
CN Aluminum gallium indium nitride (Al_{0.28}Ga_{0.66}In_{0.06}N) (9CI) (CA INDEX
NAME)

Component	Ratio	Component
		Registry Number
N	1	17778-88-0
In	0.06	7440-74-6
Ga	0.66	7440-55-3
Al	0.28	7429-90-5

RN 169821-56-1 HCAPLUS
CN Aluminum gallium indium nitride (Al_{0.09}Ga_{0.9}In_{0.01}N) (9CI) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number

N		1		17778-88-0
In		0.1		7440-74-6
Ga		0.9		7440-55-3
Al		0.09		7429-90-5

L27 ANSWER 10 OF 13 HCAPLUS COPYRIGHT 2001 ACS

AN 1993:681294 HCAPLUS

DN 119:281294

TI Near-UV **electroluminescence** from a zinc cadmium sulfide selenide/zinc sulfide selenide metal-**insulator-semiconductor** diode on gallium phosphide grown by molecular beam epitaxy

AU Ichino, Kunio; Onishi, Toshikazu; Kawakami, Yoichi; Fujita, Shizuo; Fujita, Shigeo

CS Dep. Electr. Eng., Kyoto Univ., Kyoto, 606-01, Japan

SO Jpn. J. Appl. Phys., Part 2 (1993), 32(9A), L1200-L1202

CODEN: JAPL D8; ISSN: 0021-4922

DT Journal

LA English

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 75

AB A near-UV light-emitting diode based on metal-**insulator-semiconductor** structure using a ZnCdSSe/ZnSSe single quantum well system on a GaP substrate is demonstrated. The device emits intense near-UV light at a wavelength of 391 nm from the ZnCdSSe quantum well with current injection at 77 K.

ST electroluminescence cadmium zinc selenide sulfide; luminescence electro cadmium zinc selenide sulfide

IT Luminescence, electro-
(near-UV, of cadmium zinc selenide sulfide-zinc selenide sulfide diode grown by MBE)

IT Epitaxy
(mol.-beam, of cadmium zinc selenide sulfide-zinc selenide sulfide diode, near-UV electroluminescence after)

IT 12063-98-8, Gallium phosphide, properties

RL: PRP (Properties)

(near-UV electroluminescence of cadmium zinc selenide sulfide-zinc selenide sulfide epitaxial diode on substrate of)

IT 151623-48-2, Zinc selenide sulfide (ZnSe0.14S0.86)

RL: PRP (Properties)

(near-UV electroluminescence of epitaxial diode from cadmium zinc selenide sulfide and)

IT 151623-49-3, Cadmium zinc selenide sulfide

(Cd0.23Zn0.77Se0.23S0.77)

RL: PRP (Properties)

(near-UV electroluminescence of epitaxial diode from zinc selenide sulfide and)

IT 151623-48-2, Zinc selenide sulfide (ZnSe0.14S0.86)

RL: PRP (Properties)

(near-UV electroluminescence of epitaxial diode from cadmium zinc selenide sulfide and)

RN 151623-48-2 HCAPLUS

CN Zinc selenide sulfide (ZnSe0.14S0.86) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Se	0.14	7782-49-2

S		0.86		7704-34-9
Zn		1		7440-66-6

IT 151623-49-3, Cadmium zinc selenide sulfide
(Cd0.23Zn0.77Se0.23S0.77)
RL: PRP (Properties)
(near-UV electroluminescence of epitaxial diode from zinc selenide sulfide and)

RN 151623-49-3 HCAPLUS

CN Cadmium zinc selenide sulfide (Cd0.23Zn0.77Se0.23S0.77) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
Se	0.23	7782-49-2
S	0.77	7704-34-9
Zn	0.77	7440-66-6
Cd	0.23	7440-43-9

L27 ANSWER 11 OF 13 HCAPLUS COPYRIGHT 2001 ACS

AN 1993:591556 HCAPLUS

DN 119:191556

TI Metal-insulator-semiconductor-type (MIS)
electroluminescent device with high efficiency

IN Ando, Takashi; Sasaki, Toru; Matsuoka, Takashi; Katsui, Akinori

PA Nippon Telegraph and Telephone Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01L033-00

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 74

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----		-----	-----	-----
PI	JP 04209578	A2	19920730	JP 1990-406248	19901207
	JP 2893099	B2	19990517		
AB	In the device consisting of a single crystal substrate coated with a n-type (InxGayAll-x-y)N (0 .ltoreq. x, y, x + y .ltoreq. 1) layer, a semi-insulating (InxGayAll-x-y)N light-emitting layer, and a metal electrode, the interface of the electrode has .gtoreq.1 at. layers of (InxGayAll-x-y)S surface-improving layer. The device showed high differential quantum efficiency.				
ST	semiconductor electroluminescent device; sulfide surface improving semiconductor electroluminescent				
IT	Electroluminescent devices (semiconductive, having aluminum gallium indium sulfide surface-improving layer, with high conversion efficiency)				
IT	25617-97-4, Gallium nitride 127575-65-9, Aluminum gallium indium nitride ((Al,Ga,In)N) RL: PRP (Properties) (semiconductor electroluminescent device light-emitting layer)				
IT	53238-24-7, Gallium sulfide 150581-24-1, Aluminum gallium indium sulfide RL: PRP (Properties) (semiconductor electroluminescent device				

surface-improving layer, for high efficiency)
 IT 127575-65-9, Aluminum gallium indium nitride ((Al,Ga,In)N)
 RL: PRP (Properties)
 (semiconductor electroluminescent device
 light-emitting layer)
 RN 127575-65-9 HCAPLUS
 CN Aluminum gallium indium nitride ((Al,Ga,In)N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
In	0 - 1	7440-74-6
Ga	0 - 1	7440-55-3
Al	0 - 1	7429-90-5

L27 ANSWER 12 OF 13 HCAPLUS COPYRIGHT 2001 ACS

AN 1991:570568 HCAPLUS

DN 115:170568

TI Metal-insulator-semiconductor
 electroluminescent device

IN Matsuoka, Takashi; Kawaguchi, Nobuhiro; Katsui, Akinori

PA Nippon Telegraph and Telephone Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01L033-00

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related
 Properties)

Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 03040472	A2	19910221	JP 1989-174202	19890707

AB A metal-insulator-semiconductor

electroluminescent device comprises an insulator layer
 sandwiched between a metal electrode and a semiconductor
 electrode, wherein .gtoreq.1 of the electrodes is transparent.

ST electroluminescent device metal insulator
 semiconductor

IT Electroluminescent devices

(metal-insulator-semiconductor).

IT 1303-00-0, Gallium arsenide (GaAs), uses and miscellaneous 37382-15-3,
 Aluminum gallium arsenide ((Al,Ga)As) 59989-74-1, Zinc selenide
 sulfide (Zn(Se,S)) 107102-89-6, Aluminum gallium indium phosphide
 ((Al,Ga,In)P)

RL: USES (Uses)

(metal-insulator-semiconductor
 electroluminescent devices contg.)

IT 59989-74-1, Zinc selenide sulfide (Zn(Se,S))

RL: USES (Uses)

(metal-insulator-semiconductor
 electroluminescent devices contg.)

RN 59989-74-1 HCAPLUS

CN Zinc selenide sulfide (Zn(Se,S)) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
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Se		0 - 1		7782-49-2
S		0 - 1		7704-34-9
Zn		1		7440-66-6

L27 ANSWER 13 OF 13 HCAPLUS COPYRIGHT 2001 ACS
 AN 1987:186125 HCAPLUS
 DN 106:186125
 TI Planar MIS-type blue-emitting electroluminescent device
 IN Mizumoto, Teruyuki; Shimobayashi, Takashi; Ito, Naoyuki; Okamoto, Norihisa
 PA Seiko Epson Corp., Japan
 SO Jpn. Kokai Tokkyo Koho, 8 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM H01L033-00
 ICS H01L021-365
 CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 61224372	A2	19861006	JP 1985-64756	19850328

AB A planar MIS-junction blue-emitting electroluminescent device comprises a GaAs single-cryst. substrate and low-resistance n-type ZnSxSey single-cryst. thin film, wherein the thin film is fabricated by organometallic chem. vapor deposition using an adduct of R2Zn and R2S (R = alkyl) as the Zn source, H2S or H2Se as the group VI element source, and a donor-impurity source that contains group III and group VII organometallic compds.

ST blue emitting planar **electroluminescent** device; metal **insulator semiconductor electroluminescent** device

IT Electroluminescent devices
 (MIS-junction, blue-emitting, planar)

IT Sulfides, uses and miscellaneous
 RL: USES (Uses)
 (alkyl, in zinc selenide sulfide film formation for MIS electroluminescent devices)

IT **59989-74-1**
 RL: DEV (Device component use); USES (Uses)
 (electroluminescent device from, MIS, blue-emitting)

IT 7440-66-6D, alkyl compds. 7783-06-4, uses and miscellaneous 7783-07-5
 RL: USES (Uses)
 (in zinc selenide sulfide film formation for MIS electroluminescent devices)

IT **59989-74-1**
 RL: DEV (Device component use); USES (Uses)
 (electroluminescent device from, MIS, blue-emitting)

RN 59989-74-1 HCAPLUS

CN Zinc selenide sulfide (Zn(Se,S)) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Se	0 - 1	7782-49-2
S	0 - 1	7704-34-9
Zn	1	7440-66-6

L7	1120	SEA FILE=REGISTRY ABB=ON	PLU=ON	(ZN(L)SE)/ELS AND (CD OR MG OR BE OR S) (L) 3-7/ELC.SUB
L9	779	SEA FILE=REGISTRY ABB=ON	PLU=ON	(GA(L)N)/ELS AND (IN OR AL) AND 2-8/ELC.SUB
L13	18531	SEA FILE=REGISTRY ABB=ON	PLU=ON	ZN(L) (S OR SE OR MG OR CD OR BE)/ELS AND 3-6/ELC.SUB
L14	9750	SEA FILE=REGISTRY ABB=ON	PLU=ON	ZN(L) (S OR SE OR MG OR CD OR BE)/ELS AND 3-4/ELC.SUB
L16	3094	SEA FILE=REGISTRY ABB=ON	PLU=ON	L14 AND (SE OR S)/ELS
L19	64	SEA FILE=REGISTRY ABB=ON	PLU=ON	(AL(L)IN(L)N)/ELS AND 3/ELC
L20	4515	SEA FILE=HCAPLUS ABB=ON	PLU=ON	(ELECTROLUMIN? OR EL) (L) SEMICONDUCT?
L22	8916	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L7 OR L9
L23	29111	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L13
L24	15460	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L16 OR L19
L26	249	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L20 AND INSULATOR?
L27	13	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L26 AND (L22 OR L23 OR L24)
L29	1726	SEA FILE=HCAPLUS ABB=ON	PLU=ON	EL(S) DEVICE?
L30	41	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L29 AND (L22 OR L23 OR L24)
L31	41	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L30 NOT L27
L32	24	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L31 AND SEMICONDUCT?
L33	2	SEA FILE=HCAPLUS ABB=ON	PLU=ON	INSULAT? AND L32

L33 ANSWER 1 OF 2 HCAPLUS COPYRIGHT 2001 ACS
 AN 1996:424860 HCAPLUS
 DN 125:71371
 TI Gallium nitride-base blue electroluminescent devices and their manufacture
 IN Shakuda, Yukio
 PA Rohm Kk, Japan
 SO Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM H01S003-18
 ICS H01L033-00
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
 Section cross-reference(s): 76
 FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08064913	A2	19960308	JP 1994-202480	19940826
	US 5838029	A	19981117	US 1995-517121	19950821
PRAI	JP 1994-196852	A	19940822		
	JP 1994-202478	A	19940826		
	JP 1994-202480	A	19940826		
	JP 1994-202481	A	19940826		
AB	The devices consist of a Si single crystal substrate, on which an insulating film and GaN-base compd. semiconductor layers are formed.				
ST	electroluminescent device gallium nitride silicon; EL device gallium nitride silicon; silicon substrate gallium nitride EL; LED gallium nitride silicon substrate; laser gallium nitride silicon substrate				
IT	Electroluminescent devices (manuf. of gallium nitride EL devices on silicon substrate)				
IT	Group IIIA element pnictides RL: DEV (Device component use); USES (Uses) (manuf. of gallium nitride EL devices on silicon substrate)				
IT	Lasers (semiconductor , manuf. of gallium nitride EL devices on silicon substrate)				
IT	120994-23-2 , Gallium indium nitride ((Ga,In)N) RL: DEV (Device component use); USES (Uses) (active layer; manuf. of gallium nitride EL devices on silicon substrate)				
IT	25617-97-4, Gallium nitride RL: DEV (Device component use); USES (Uses) (buffer layer and cap layer; manuf. of gallium nitride EL devices on silicon substrate)				
IT	106097-44-3 , Aluminum gallium nitride ((Al,Ga)N) RL: DEV (Device component use); USES (Uses) (cladding layer; manuf. of gallium nitride EL devices on silicon substrate)				
IT	1344-28-1, Aluminum oxide, uses 12033-89-5, Silicon nitride (Si ₃ N ₄), uses RL: DEV (Device component use); USES (Uses) (insulating film; manuf. of gallium nitride EL devices on silicon substrate)				
IT	7440-21-3, Silicon, uses				

RL: DEV (Device component use); USES (Uses)
 (manuf. of gallium nitride **EL devices** on silicon substrate)

IT **120994-23-2**, Gallium indium nitride ((Ga,In)N)
 RL: DEV (Device component use); USES (Uses)
 (active layer; manuf. of gallium nitride **EL devices** on silicon substrate)

RN 120994-23-2 HCAPLUS

CN Gallium indium nitride ((Ga,In)N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
In	0 - 1	7440-74-6
Ga	0 - 1	7440-55-3

IT **106097-44-3**, Aluminum gallium nitride ((Al,Ga)N)
 RL: DEV (Device component use); USES (Uses)
 (cladding layer; manuf. of gallium nitride **EL devices** on silicon substrate)

RN 106097-44-3 HCAPLUS

CN Aluminum gallium nitride ((Al,Ga)N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
Ga	0 - 1	7440-55-3
Al	0 - 1	7429-90-5

L33 ANSWER 2 OF 2 HCAPLUS COPYRIGHT 2001 ACS

AN 1992:161510 HCAPLUS

DN 116:161510

TI Emission characteristics of terbium trifluoride-doped (zinc, cadmium)sulfide and terbium trifluoride-doped zinc(sulfide, selenide) **EL** (electroluminescent) **devices**

AU Im, Y. M.; Kim, H. D.; Kim, H. J.; Kang, E. D.; Lee, S. K.; Lee, C. J.
 CS Coll. Eng., Inha Univ., Inchun, S. Korea

SO Nonmunjip - Sanop Kwahak Kisul Yonguso (Inha Taehakkyo) (1990), 18, 179-89
 CODEN: NSKYDM; ISSN: 0253-6234

DT Journal

LA Korean

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB The a.c. thin film electroluminescence with doubly **insulating** layer structure was studied. ZnS; (Zn, Cd)S, Zn(S, Se) films doped with TbF3 were used in the **EL devices**. The **devices** were prepd. by an electron beam evapn. technique on the glass substrates coated with indium-tin-oxide and their **EL** characteristics were investigated. The investigated results of the II-VI compd. **semiconductor EL devices** are summarized. X-ray diffraction patterns of ZnS, (Zn, Cd)S and Zn(S, Se) thin films are polycryst. with cubic structure. The films can be produced in the form of mixed crystal combinations in every proportion. The ZnS **EL device** with TbF3 concn. of 2.0 mol% shows the strongest emission intensity. The optimum thickness of active and **insulating** layers of the device is 6,000-8,000 .ANG. and 3,000 .ANG., resp. The spectrum of the ZnS: TbF3 **EL device** shows 4 peaks in

the visible region. The EL spectra of Zn(S, Se):TbF3 and (Zn, Cd)S:TbF3 are similar to the ZnS:TbF2 EL spectrum. The EL spectra of (Zn, Cd)S:TbF3 and Zn(S, Se):TbF3 EL devices do not depend on the mixing ratio of 2 sulfides and are the same as those of the ZnS:TbF3 EL device. With increasing ZnSe or CdS content in Zn(S, Se):TbF3 or (Zn, Cd)S:TbF3 cells, the bandgap energy of the active layer decreases. The lowering of the threshold voltage for EL emission which was obsd. in the above cells may be attributed to this effect. However, these devices exhibit inferior brightness-voltage characteristics and lower EL efficiency compared with the ZnS:TbF3 EL device.

ST electroluminescent device cadmium zinc sulfide terbium; selenide sulfide
zinc electroluminescent device terbium
IT Luminescence, electro-
(of terbium-doped cadmium zinc sulfide or zinc selenide sulfide or zinc sulfide)
IT Electroluminescent devices
(terbium-doped cadmium zinc sulfide or zinc selenide sulfide or zinc sulfide)
IT 1314-98-3, Zinc sulfide, uses 12442-27-2, Cadmium zinc sulfide ((Cd,Zn)S)
RL: USES (Uses)
(electroluminescent device from terbium-contg., characteristics of)
IT 59989-74-1, Zinc selenide sulfide (Zn(Se,S))
RL: PRP (Properties)
(electroluminescent device from terbium-contg., characteristics of)
IT 22541-20-4, Terbium(3+), uses
RL: USES (Uses)
(electroluminescent thin-film devices from cadmium zinc selenide or zinc selenide sulfide or zinc sulfide doped with, characteristics of)
IT 12442-27-2, Cadmium zinc sulfide ((Cd,Zn)S)
RL: USES (Uses)
(electroluminescent device from terbium-contg., characteristics of)
RN 12442-27-2 HCAPLUS
CN Cadmium zinc sulfide ((Cd,Zn)S) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	1	7704-34-9
Zn	0 - 1	7440-66-6
Cd	0 - 1	7440-43-9

IT 59989-74-1, Zinc selenide sulfide (Zn(Se,S))
RL: PRP (Properties)
(electroluminescent device from terbium-contg., characteristics of)
RN 59989-74-1 HCAPLUS
CN Zinc selenide sulfide (Zn(Se,S)) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Se	0 - 1	7782-49-2
S	0 - 1	7704-34-9
Zn	1	7440-66-6

L7	1120	SEA FILE=REGISTRY ABB=ON	PLU=ON	(ZN(L)SE)/ELS AND (CD OR MG OR BE OR S) (L) 3-7/ELC.SUB
L9	779	SEA FILE=REGISTRY ABB=ON	PLU=ON	(GA(L)N)/ELS AND (IN OR AL) AND 2-8/ELC.SUB
L13	18531	SEA FILE=REGISTRY ABB=ON	PLU=ON	ZN(L) (S OR SE OR MG OR CD OR BE)/ELS AND 3-6/ELC.SUB
L14	9750	SEA FILE=REGISTRY ABB=ON	PLU=ON	ZN(L) (S OR SE OR MG OR CD OR BE)/ELS AND 3-4/ELC.SUB
L16	3094	SEA FILE=REGISTRY ABB=ON	PLU=ON	L14 AND (SE OR S)/ELS
L19	64	SEA FILE=REGISTRY ABB=ON	PLU=ON	(AL(L)IN(L)N)/ELS AND 3/ELC
L20	4515	SEA FILE=HCAPLUS ABB=ON	PLU=ON	(ELECTROLUMIN? OR EL) (L) SEMICONDUCT?
L22	8916	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L7 OR L9
L23	29111	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L13
L24	15460	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L16 OR L19
L26	249	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L20 AND INSULATOR?
L27	13	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L26 AND (L22 OR L23 OR L24)
L29	1726	SEA FILE=HCAPLUS ABB=ON	PLU=ON	EL(S) DEVICE?
L30	41	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L29 AND (L22 OR L23 OR L24)
L31	41	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L30 NOT L27
L32	24	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L31 AND SEMICONDUCT?
L33	2	SEA FILE=HCAPLUS ABB=ON	PLU=ON	INSULAT? AND L32
L34	23	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L32 AND LAYER?
L35	12	SEA FILE=HCAPLUS ABB=ON	PLU=ON	(CORE OR CLADD?) AND L34
L36	11	SEA FILE=HCAPLUS ABB=ON	PLU=ON	L35 NOT (L33 OR L27)

L36 ANSWER 1 OF 11 HCAPLUS COPYRIGHT 2001 ACS
 AN 1997:442804 HCAPLUS
 DN 127:87962
 TI Manufacture of **semiconductive** electroluminescent device with
 long service life
 IN Ishikawa, Hironori
 PA Toshiba Corp., Japan
 SO Jpn. Kokai Tokkyo Koho, 5 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM H01L033-00
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related
 Properties)
 Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09162441	A2	19970620	JP 1995-316839	19951205
AB	The device includes a high-resistant region surrounding a light-emitting part and extending to the device inside. The device is manufd. by MOCVD and formation of the high-resistant region as above preferably by ion implantation or dopant diffusion.				
ST	semiconductive electroluminescent device service life; aluminum indium gallium nitride EL device ; sidewall protective resistive layer EL device ; implantation sidewall resistive layer EL device ; diffusion sidewall resistive layer EL device				
IT	Ion implantation Thermal diffusion (manuf. of EL device with high-resistant sidewall region inhibiting leak current)				
IT	Electroluminescent devices (semiconductive ; manuf. of EL device with high-resistant sidewall region inhibiting leak current)				
IT	120994-23-2P , Indium gallium nitride RL: DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process); USES (Uses) (active layer ; manuf. of EL device with high-resistant sidewall region inhibiting leak current)				
IT	106097-44-3P , Aluminum gallium nitride ((Al,Ga)N) RL: DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process); USES (Uses) (buffer layer ; manuf. of EL device with high-resistant sidewall region inhibiting leak current)				
IT	1333-74-0 , Hydrogen, uses RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses) (dopant, high-resistant region contg.; manuf. of EL device with high-resistant sidewall region inhibiting leak current)				
IT	25617-97-4P , Gallium nitride RL: DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process); USES (Uses) (doped, cladding layer ; manuf. of EL device with high-resistant sidewall region inhibiting leak				

current)

IT 108730-15-0P, Aluminum gallium indium phosphide (Al₀-0.5Ga₀-0.5In_{0.5}P)
 RL: DEV (Device component use); IMF (Industrial manufacture); PEP
 (Physical, engineering or chemical process); PREP (Preparation); PROC
 (Process); USES (Uses)
 (doped; manuf. of **EL device** with high-resistant
 sidewall region inhibiting leak current)

IT 1344-28-1, Aluminum oxide (Al₂O₃), uses
 RL: DEV (Device component use); PEP (Physical, engineering or chemical
 process); PROC (Process); USES (Uses)
 (sapphire-type substrate; manuf. of **EL device** with
 high-resistant sidewall region inhibiting leak current)

IT 1303-00-0, Gallium arsenide, uses
 RL: DEV (Device component use); PEP (Physical, engineering or chemical
 process); PROC (Process); USES (Uses)
 (substrate; manuf. of **EL device** with high-resistant
 sidewall region inhibiting leak current)

IT 120994-23-2P, Indium gallium nitride
 RL: DEV (Device component use); IMF (Industrial manufacture); PEP
 (Physical, engineering or chemical process); PREP (Preparation); PROC
 (Process); USES (Uses)
 (active **layer**; manuf. of **EL device** with
 high-resistant sidewall region inhibiting leak current)

RN 120994-23-2 HCAPLUS

CN Gallium indium nitride ((Ga,In)N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
In	0 - 1	7440-74-6
Ga	0 - 1	7440-55-3

IT 106097-44-3P, Aluminum gallium nitride ((Al,Ga)N)
 RL: DEV (Device component use); IMF (Industrial manufacture); PEP
 (Physical, engineering or chemical process); PREP (Preparation); PROC
 (Process); USES (Uses)
 (buffer **layer**; manuf. of **EL device** with
 high-resistant sidewall region inhibiting leak current)

RN 106097-44-3 HCAPLUS

CN Aluminum gallium nitride ((Al,Ga)N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
Ga	0 - 1	7440-55-3
Al	0 - 1	7429-90-5

L36 ANSWER 2 OF 11 HCAPLUS COPYRIGHT 2001 ACS

AN 1996:554502 HCAPLUS

DN 125:180949

TI Nitride compound electroluminescent (**EL**) **devices** with
 high luminance

IN Unno, Tsunehiro; Shibata, Masatomo; Watanabe, Masatoshi; Takahashi,
 Takeshi; Kuma, Shoji

PA Hitachi Cable, Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT Patent
 LA Japanese
 IC ICM H01L033-00
 ICS H01S003-18
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08167735	A2	19960625	JP 1994-307430	19941212
AB	<p>The EL devices (e.g., LEDs, LDs), consisting of a laminate of nitride compd. semiconductor (e.g., GaN, AlN, InN) or nitride compd. mixed crystal semiconductor (e.g., AlGaIn, InGaIn, AlInN) layers formed on a sapphire substrate coated with a nitride compd. semiconductor buffer layer: n-type current-diffusion layer/n-type cladding layer /active layer/p-type cladding layer (cladding layers with band gap larger than the active layer)/p-type current-diffusion layer, have the difference between the mixed crystal ratio of the p- and n-type current-diffusion layers and the mixed crystal ratio of the active layer .ltoreq.0.2. The p type and the n type may be exchanged. Alternatively the EL devices have (1) InGaIn current-diffusion layers and active layer and InGaIn, GaN, or AlGaIn cladding layers with the mixed crystal ratio difference .ltoreq.0.2; (2) AlGaIn current-diffusion layers, active layer, and cladding layers with the mixed crystal ratio difference .ltoreq.0.1, or (3) AlInN current-diffusion layers and active layer, and AlInN or AlGaIn cladding layers with the mixed crystal ratio difference .ltoreq.0.1. The EL devices give high-luminance emission at the wavelength from green to UV range.</p>				
ST	electroluminescent device nitride mixed crystal; EL device nitride mixed crystal; LED nitride mixed crystal; laser diode nitride mixed crystal				
IT	Electroluminescent devices (nitride compd. semiconductor EL devices for high luminance from green to UV range)				
IT	Lasers (semiconductor , nitride compd. semiconductor EL devices for high luminance from green to UV range)				
IT	24304-00-5, Aluminum nitride 25617-97-4, Gallium nitride 25617-98-5, Indium nitride 106097-44-3, Aluminum gallium nitride ((Al,Ga)N) 120994-22-1, Aluminum indium nitride (Al0-1In0-1N) 120994-23-2, Gallium indium nitride ((Ga,In)N) RL: DEV (Device component use); USES (Uses) (nitride compd. semiconductor EL devices for high luminance from green to UV range)				
IT	106097-44-3, Aluminum gallium nitride ((Al,Ga)N) 120994-22-1, Aluminum indium nitride (Al0-1In0-1N) 120994-23-2, Gallium indium nitride ((Ga,In)N) RL: DEV (Device component use); USES (Uses) (nitride compd. semiconductor EL devices for high luminance from green to UV range)				
RN	106097-44-3 HCAPLUS				
CN	Aluminum gallium nitride ((Al,Ga)N) (9CI) (CA INDEX NAME)				

Component	Ratio	EL Component Registry Number
=====+=====+=====		

N		1		17778-88-0
Ga		0 - 1		7440-55-3
Al		0 - 1		7429-90-5

RN 120994-22-1 HCAPLUS

CN Aluminum indium nitride ((Al,In)N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
In	0 - 1	7440-74-6
Al	0 - 1	7429-90-5

RN 120994-23-2 HCAPLUS

CN Gallium indium nitride ((Ga,In)N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
In	0 - 1	7440-74-6
Ga	0 - 1	7440-55-3

L36 ANSWER 3 OF 11 HCAPLUS COPYRIGHT 2001 ACS

AN 1996:534018 HCAPLUS

DN 125:180947

TI Group II-VI **semiconductor** electroluminescent (EL) **devices** with decreased lamination defects

IN Kuroda, Naotaka; Iwata, Hiroshi

PA Nippon Electric Co, Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01S003-18

ICS H01L033-00

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08148765	A2	19960607	JP 1994-307075	19941117
	JP 2586349	B2	19970226		

AB The **EL devices** have a Be-contg. Group II-VI buffer **layer** (e.g., BeTe, BeSe, BeS, their 3-, or 4-component mixed crystal) between a **semiconductor** substrate (e.g., not II-VI: GaAs, InP, GaP, Si, Ge) and Group II-VI epitaxial **layers** contg. a light-emitting **layer** (e.g., active **layer**: CdZnSe, ZnSe, ZnSSe, ZnMgSeTe) or between a buffer **layer** formed on the substrate with the same compn. as the substrate and the Group II-VI epitaxial **layers**.

ST Group II VI electroluminescent device; **EL device** II VI buffer **layer**

IT Electroluminescent **devices**
(Group II-VI **EL devices** with beryllium-contg. buffer **layer** for decreased lamination defects)

IT Lasers

(semiconductor, Group II-VI EL devices
with beryllium-contg. buffer layer for decreased lamination
defects)

IT 1315-09-9, Zinc selenide 59989-74-1, Zinc selenide sulfide
(Zn(Se,S)) 158346-21-5, Cadmium zinc selenide
RL: DEV (Device component use); USES (Uses)
(active layer; Group II-VI EL devices
with beryllium-contg. buffer layer for decreased lamination
defects)

IT 12232-25-6, Beryllium selenide (base) 12232-27-8, Beryllium telluride
13598-22-6, Beryllium sulfide 180618-05-7, Beryllium cadmium telluride
((Be,Cd)Te)
RL: DEV (Device component use); USES (Uses)
(buffer layer; Group II-VI EL devices
with beryllium-contg. buffer layer for decreased lamination
defects)

IT 108398-96-5, Cadmium zinc selenide telluride (cdznsete)
137575-57-6, Magnesium zinc selenide sulfide ((Mg,Zn)(Se,S))
156320-62-6, Cadmium magnesium zinc selenide (cdmgznse)
160641-06-5, Magnesium zinc selenide telluride (mgznsete)
RL: DEV (Device component use); USES (Uses)
(cladding layer; Group II-VI EL devices
with beryllium-contg. buffer layer for
decreased lamination defects)

IT 1303-00-0, Gallium arsenide, uses 7440-21-3, Silicon, uses 7440-56-4,
Germanium, uses 12063-98-8, Gallium phosphide, uses 22398-80-7, Indium
phosphide, uses
RL: DEV (Device component use); USES (Uses)
(substrate; Group II-VI EL devices with
beryllium-contg. buffer layer for decreased lamination
defects)

IT 59989-74-1, Zinc selenide sulfide (Zn(Se,S)) 158346-21-5
, Cadmium zinc selenide
RL: DEV (Device component use); USES (Uses)
(active layer; Group II-VI EL devices
with beryllium-contg. buffer layer for decreased lamination
defects)

RN 59989-74-1 HCAPLUS
CN Zinc selenide sulfide (Zn(Se,S)) (9CI) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
Se	0 - 1	7782-49-2
S	0 - 1	7704-34-9
Zn	1	7440-66-6

RN 158346-21-5 HCAPLUS
CN Cadmium zinc selenide (9CI) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
Se	x	7782-49-2
Zn	x	7440-66-6
Cd	x	7440-43-9

IT 108398-96-5, Cadmium zinc selenide telluride (cdznsete)
137575-57-6, Magnesium zinc selenide sulfide ((Mg,Zn)(Se,S))
156320-62-6, Cadmium magnesium zinc selenide (cdmgznse)

160641-06-5, Magnesium zinc selenide telluride (mgznsete)

RL: DEV (Device component use); USES (Uses)

(cladding layer; Group II-VI EL

devices with beryllium-contg. buffer layer for
decreased lamination defects)

RN 108398-96-5 HCAPLUS

CN Cadmium zinc selenide telluride ((Cd,Zn)(Se,Te)) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Te	0 - 1	13494-80-9
Se	0 - 1	7782-49-2
Zn	0 - 1	7440-66-6
Cd	0 - 1	7440-43-9

RN 137575-57-6 HCAPLUS

CN Magnesium zinc selenide sulfide ((Mg,Zn)(Se,S)) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Se	0 - 1	7782-49-2
S	0 - 1	7704-34-9
Zn	0 - 1	7440-66-6
Mg	0 - 1	7439-95-4

RN 156320-62-6 HCAPLUS

CN Cadmium magnesium zinc selenide ((Cd,Mg,Zn)Se) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Se	1	7782-49-2
Zn	0 - 1	7440-66-6
Cd	0 - 1	7440-43-9
Mg	0 - 1	7439-95-4

RN 160641-06-5 HCAPLUS

CN Magnesium zinc selenide telluride ((Mg,Zn)(Se,Te)) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Te	0 - 1	13494-80-9
Se	0 - 1	7782-49-2
Zn	0 - 1	7440-66-6
Mg	0 - 1	7439-95-4

L36 ANSWER 4 OF 11 HCAPLUS COPYRIGHT 2001 ACS

AN 1996:466579 HCAPLUS

DN 125:99719

TI Gallium nitride **semiconductor** electroluminescent devices and
their manufacture

IN Shakuda, Yukio

PA Rohm Kk, Japan

SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DT Patent

LA Japanese
 IC ICM H01L033-00
 ICS H01S003-18
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
 Section cross-reference(s): 76

FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08116092	A2	19960507	JP 1995-215625	19950824
PRAI	JP 1994-202481	A	19940826		

AB Electroluminescent (EL) devices comprise a GaN-based **semiconductor layer** (e.g., multilayer consisting of n-type $\text{Ga}_{1-x}\text{In}_x\text{N}$ ($0 < x \leq 1$) buffer layer, n-type $\text{Al}_x\text{Ga}_{1-x}\text{N}$ ($0 < x < 1$) lower **cladding layer**, $\text{Ga}_{1-x}\text{In}_x\text{N}$ ($0 < x \leq 1$) active layer, p-type $\text{Al}_x\text{Ga}_{1-x}\text{N}$ ($0 < x < 1$) upper **cladding layer**, p-type GaN capping layer) formed on a Group III-V compd. **semiconductor** (e.g., GaAs, InAs, GaP, InP) substrate. The GaN-based **semiconductor layer** is preferably formed on a Group V surface of the substrate. The **EL device** manuf. involves forming the GaN-based **semiconductor** multilayer on a Group III-V substrate with lattice match, forming electrodes on the substrate and the capping layer, and cleaving the chip. Lattice mismatch, crystal defects, and dislocations are reduced in the devices (LEDs, laser diodes, etc.).

ST gallium nitride electroluminescent device substrate; electroluminescent device gallium nitride substrate; LED gallium nitride substrate; Group III pnictide substrate LED; laser diode gallium nitride substrate

IT Electroluminescent devices
 (gallium nitride system-based electroluminescent devices with Group III-V substrates and their manuf.)

IT Group IIIA element pnictides
 RL: DEV (Device component use); USES (Uses)
 (substrate; gallium nitride system-based electroluminescent devices with Group III-V substrates and their manuf.)

IT Lasers
 (**semiconductor**, gallium nitride system-based electroluminescent devices with Group III-V substrates and their manuf.)

IT 25617-97-4P, Gallium nitride
 RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
 (capping layer; gallium nitride system-based electroluminescent devices with Group III-V substrates and their manuf.)

IT 106097-44-3P, Aluminum gallium nitride ((Al,Ga)N)
 RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
 (**cladding layer**; gallium nitride system-based electroluminescent devices with Group III-V substrates and their manuf.)

IT 120994-23-2P, Gallium indium nitride ((Ga,In)N)
 RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
 (gallium nitride system-based electroluminescent devices with Group III-V substrates and their manuf.)

IT 1303-00-0, Gallium arsenide, uses 1303-11-3, Indium arsenide, uses 12063-98-8, Gallium phosphide, uses 22398-80-7, Indium phosphide, uses
 RL: DEV (Device component use); USES (Uses)
 (substrate; gallium nitride system-based electroluminescent devices

with Group III-V substrates and their manuf.)
 IT **106097-44-3P**, Aluminum gallium nitride ((Al,Ga)N)
 RL: DEV (Device component use); PNU (Preparation, unclassified); PREP
 (Preparation); USES (Uses)
 (cladding layer; gallium nitride system-based
 electroluminescent devices with Group III-V substrates and their
 manuf.)
 RN 106097-44-3 HCAPLUS
 CN Aluminum gallium nitride ((Al,Ga)N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
Ga	0 - 1	7440-55-3
Al	0 - 1	7429-90-5

IT **120994-23-2P**, Gallium indium nitride ((Ga,In)N)
 RL: DEV (Device component use); PNU (Preparation, unclassified); PREP
 (Preparation); USES (Uses)
 (gallium nitride system-based electroluminescent devices with Group
 III-V substrates and their manuf.)
 RN 120994-23-2 HCAPLUS
 CN Gallium indium nitride ((Ga,In)N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
In	0 - 1	7440-74-6
Ga	0 - 1	7440-55-3

L36 ANSWER 5 OF 11 HCAPLUS COPYRIGHT 2001 ACS
 AN 1996:455370 HCAPLUS
 DN 125:99718
 TI Group II-VI **semiconductor** electroluminescent devices
 IN Kato, Gosaku; Okuyama, Hiroyuki
 PA Sony Corp, Japan
 SO Jpn. Kokai Tokkyo Koho, 11 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM H01S003-18
 ICS H01L033-00
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related
 Properties)
 Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08111566	A2	19960430	JP 1994-268359	19941006

AB The devices comprises a compd. **semiconductor** (e.g., GaAs)
 substrate, and a Group II-VI (e.g., ZnCdSe-based, ZnSe-based, ZnSSe-based,
 ZnMgSSe-based) active **layer** sandwiched by p-type and n-type
 ZnMgSSe **cladding layers**, wherein the Mg compn. ratio
 of the n-type **cladding layer** is >0.10 and
 .ltoreq.0.20.
 ST **semiconductor EL device** II chalcogenide;
 laser diode Group II chalcogenide; LED II chalcogenide **cladding**

layer

IT Electroluminescent **devices**
 (Group II-VI **semiconductor EL devices**
 with low-threshold c.d. and long life)

IT Group IIB element chalcogenides
 RL: DEV (Device component use); PNU (Preparation, unclassified); PREP
 (Preparation); USES (Uses)
 (active **layer**; Group II-VI **semiconductor EL**
devices with low-threshold c.d. and long life)

IT Lasers
 (**semiconductor**, Group II-VI **semiconductor**
EL devices with low-threshold c.d. and long life)

IT 121110-57-4P, Cadmium zinc selenide (Cd0.08Zn0.92Se)
 RL: DEV (Device component use); PNU (Preparation, unclassified); PREP
 (Preparation); USES (Uses)
 (active **layer**; Group II-VI **semiconductor EL**
devices with low-threshold c.d. and long life)

IT 179038-93-8P, Magnesium zinc selenide sulfide
 (Mg0.15Zn0.85Se0.78S0.22)
 RL: DEV (Device component use); PNU (Preparation, unclassified); PREP
 (Preparation); USES (Uses)
 (chlorine-doped, **cladding layer**; Group II-VI
semiconductor EL devices with low-threshold
 c.d. and long life)

IT 161123-03-1P, Magnesium zinc selenide sulfide
 (Mg0.09Zn0.91Se0.82S0.18)
 RL: DEV (Device component use); PNU (Preparation, unclassified); PREP
 (Preparation); USES (Uses)
 (nitrogen-doped, **cladding layer**; Group II-VI
semiconductor EL devices with low-threshold
 c.d. and long life)

IT 113937-99-8P, Zinc selenide sulfide (ZnSe0.94S0.06)
 RL: DEV (Device component use); PNU (Preparation, unclassified); PREP
 (Preparation); USES (Uses)
 (optical waveguide **layer**; Group II-VI **semiconductor**
EL devices with low-threshold c.d. and long life)

IT 1303-00-0, Gallium arsenide, uses:
 RL: DEV (Device component use); USES (Uses)
 (substrate; Group II-VI **semiconductor EL**
devices with low-threshold c.d. and long life)

IT 121110-57-4P, Cadmium zinc selenide (Cd0.08Zn0.92Se)
 RL: DEV (Device component use); PNU (Preparation, unclassified); PREP
 (Preparation); USES (Uses)
 (active **layer**; Group II-VI **semiconductor EL**
devices with low-threshold c.d. and long life)

RN 121110-57-4 HCAPLUS

CN Cadmium zinc selenide (Cd0.08Zn0.92Se) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Se	1	7782-49-2
Zn	0.92	7440-66-6
Cd	0.08	7440-43-9

IT 179038-93-8P, Magnesium zinc selenide sulfide
 (Mg0.15Zn0.85Se0.78S0.22)
 RL: DEV (Device component use); PNU (Preparation, unclassified); PREP
 (Preparation); USES (Uses)
 (chlorine-doped, **cladding layer**; Group II-VI

semiconductor EL devices with low-threshold
c.d. and long life)

RN 179038-93-8 HCAPLUS

CN Magnesium zinc selenide sulfide (Mg0.15Zn0.85Se0.78S0.22) (9CI) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
Se	0.78	7782-49-2
S	0.22	7704-34-9
Zn	0.85	7440-66-6
Mg	0.15	7439-95-4

IT **161123-03-1P**, Magnesium zinc selenide sulfide
(Mg0.09Zn0.91Se0.82S0.18)

RL: DEV (Device component use); PNU (Preparation, unclassified); PREP
(Preparation); USES (Uses)

(nitrogen-doped, **cladding layer**; Group II-VI
semiconductor EL devices with low-threshold
c.d. and long life)

RN 161123-03-1 HCAPLUS

CN Magnesium zinc selenide sulfide (Mg0.09Zn0.91Se0.82S0.18) (9CI) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
Se	0.82	7782-49-2
S	0.18	7704-34-9
Zn	0.91	7440-66-6
Mg	0.09	7439-95-4

IT **113937-99-8P**, Zinc selenide sulfide (ZnSe0.94S0.06)

RL: DEV (Device component use); PNU (Preparation, unclassified); PREP
(Preparation); USES (Uses)

(optical waveguide **layer**; Group II-VI **semiconductor**
EL devices with low-threshold c.d. and long life)

RN 113937-99-8 HCAPLUS

CN Zinc selenide sulfide (ZnSe0.94S0.06) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Se	0.94	7782-49-2
S	0.06	7704-34-9
Zn	1	7440-66-6

L36 ANSWER 6 OF 11 HCAPLUS COPYRIGHT 2001 ACS

AN 1996:428132 HCAPLUS

DN 125:71363

TI Blue electroluminescent devices using gallium nitride compound
semiconductor

IN Shakuda, Yukio

PA Rohm Kk, Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01L033-00
ICS H01S003-18
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08064869	A2	19960308	JP 1994-202476	19940826
	US 5825052	A	19981020	US 1995-515569	19950816
PRAI	JP 1994-202476		19940826		
	JP 1994-202477		19940826		
AB	The device comprises n- and p-type GaN-base semiconductor layers , and n- and p-type electrodes resp. formed on the n- and p-type layers . The p-type GaN-base semiconductor layer contains dopant(s) selected from Mg, Zn, Cd, Be, and Mn, and the n-type layer is doped with element(s) selected from Ge, Te, Sn, S, Se, and Te, for reducing the electrode contact resistance.				
ST	electroluminescent device gallium nitride dopant; EL device gallium nitride dopant; LED blue gallium nitride dopant				
IT	Electric contacts Electroluminescent devices (gallium nitride-base electroluminescent devices)				
IT	Group IIIA element pnictides RL: DEV (Device component use); USES (Uses) (gallium nitride-base electroluminescent devices)				
IT	25617-97-4, Gallium nitride RL: DEV (Device component use); USES (Uses) (capping layer and buffer layer ; gallium nitride-base electroluminescent devices)				
IT	106097-44-3 , Aluminum gallium nitride ((Al,Ga)N) RL: DEV (Device component use); USES (Uses) (cladding layer ; gallium nitride-base electroluminescent devices)				
IT	7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7440-21-3, Silicon, uses 7440-41-7, Beryllium, uses 7440-43-9, Cadmium, uses 7440-56-4, Germanium, uses 7440-66-6, Zinc, uses 7704-34-9, Sulfur, uses 7782-49-2, Selenium, uses 13494-80-9, Tellurium, uses RL: MOA (Modifier or additive use); USES (Uses) (gallium nitride-base electroluminescent devices)				
IT	106097-44-3 , Aluminum gallium nitride ((Al,Ga)N) RL: DEV (Device component use); USES (Uses) (cladding layer ; gallium nitride-base electroluminescent devices)				
RN	106097-44-3 HCAPLUS				
CN	Aluminum gallium nitride ((Al,Ga)N) (9CI) (CA INDEX NAME)				

Component	Ratio	Component Registry Number
N	1	17778-88-0
Ga	0 - 1	7440-55-3
Al	0 - 1	7429-90-5

L36 ANSWER 7 OF 11 HCAPLUS COPYRIGHT 2001 ACS
AN 1996:424922 HCAPLUS
DN 125:71402
TI Group II-VI **semiconductor** electroluminescent devices with long life

IN Nakano, Kazushi; Matsumoto, Osamu; Ito, Satoru; Ishibashi, Akira
 PA Sony Corp, Japan
 SO Jpn. Kokai Tokkyo Koho, 10 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM H01S003-18
 ICS H01L033-00
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08097518	A2	19960412	JP 1994-258769	19940928
AB	<p>The EL devices have 1st and 2nd cladding layers of Group II-VI compd. semiconductor (II: Zn, Mg, Cd, Hg, Be; VI: Se, Te, S) and an active layer (between the 2 cladding layers) of Group II-VI compd. semiconductor (II: Zn, Mg, Cd, Hg, Be; VI: Se, Te, S; II or VI element with smaller at. radius, e.g., S, Be, O) on a substrate (e.g., GaAs). The devices may have a Group II-VI optical waveguide layer between the active layer and the cladding layer. The cladding layers may comprise a ZnMgSSe-type compd. and the active layer may comprise a ZnCdSSe-type (0.02.ltoreq. S <0.2, 0.01.ltoreq. Cd .ltoreq.0.35) or ZnSSe-type (0.02.ltoreq. S <0.2) compd. The devices are useful as blue- or green-emitting LDs and LEDs.</p>				
ST	Group II VI EL device ; electroluminescent device II VI blue green; laser diode II VI blue green; LED II VI blue green				
IT	Alkaline earth chalcogenides Group IIB element chalcogenides RL: DEV (Device component use); USES (Uses) (Group II-VI semiconductor electroluminescent devices)				
IT	Electroluminescent devices Lasers (blue- or green-emitting; Group II-VI semiconductor electroluminescent devices)				
IT	<p>178496-72-5P, Cadmium zinc selenide sulfide (Cd_{0.25}Zn_{0.75}Se_{0.93}S_{0.07}) RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses) (active layer; Group II-VI semiconductor electroluminescent devices)</p>				
IT	<p>161123-03-1P, Zinc magnesium sulfide selenide (Zn_{0.9}Mg_{0.09}S_{0.18}Se_{0.82}) RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses) (cladding layer; Group II-VI semiconductor electroluminescent devices)</p>				
IT	<p>1303-00-0, Gallium arsenide, uses RL: DEV (Device component use); USES (Uses) (substrate; Group II-VI semiconductor electroluminescent devices)</p>				
IT	<p>109657-91-2P, Zinc sulfide selenide (ZnS_{0.16}Se_{0.84}) RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses) (waveguide layer; Group II-VI semiconductor electroluminescent devices)</p>				
IT	<p>178496-72-5P, Cadmium zinc selenide sulfide (Cd_{0.25}Zn_{0.75}Se_{0.93}S_{0.07})</p>				

RL: DEV (Device component use); PNU (Preparation, unclassified); PREP
(Preparation); USES (Uses)
(active **layer**; Group II-VI **semiconductor**
electroluminescent devices)

RN 178496-72-5 HCAPLUS

CN Cadmium zinc selenide sulfide (Cd_{0.25}Zn_{0.75}Se_{0.93}S_{0.07}) (9CI) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
Se	0.93	7782-49-2
S	0.07	7704-34-9
Zn	0.75	7440-66-6
Cd	0.25	7440-43-9

IT **161123-03-1P**, Zinc magnesium sulfide selenide
(Zn_{0.91}Mg_{0.09}S_{0.18}Se_{0.82})

RL: DEV (Device component use); PNU (Preparation, unclassified); PREP
(Preparation); USES (Uses)
(**cladding layer**; Group II-VI **semiconductor**
electroluminescent devices)

RN 161123-03-1 HCAPLUS

CN Magnesium zinc selenide sulfide (Mg_{0.09}Zn_{0.91}Se_{0.82}S_{0.18}) (9CI) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
Se	0.82	7782-49-2
S	0.18	7704-34-9
Zn	0.91	7440-66-6
Mg	0.09	7439-95-4

IT **109657-91-2P**, Zinc sulfide selenide (ZnS_{0.16}Se_{0.84})

RL: DEV (Device component use); PNU (Preparation, unclassified); PREP
(Preparation); USES (Uses)
(**waveguide layer**; Group II-VI **semiconductor**
electroluminescent devices)

RN 109657-91-2 HCAPLUS

CN Zinc selenide sulfide (ZnSe_{0.84}S_{0.16}) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Se	0.84	7782-49-2
S	0.16	7704-34-9
Zn	1	7440-66-6

L36 ANSWER 8 OF 11 HCAPLUS COPYRIGHT 2001 ACS

AN 1996:396128 HCAPLUS

DN 125:44789

TI Group II-VI **semiconductor** electroluminescent devices for short
wavelength oscillation

IN Okuyama, Hiroyuki; Ishibashi, Akira; Kato, Gosaku; Yoshida, Hiroshi;
Nakano, Kazushi; Ukita, Shoichi; Kijima, Satoru; Okamoto, Sakurako

PA Sony Corp, Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DT Patent
 LA Japanese
 IC ICM H01S003-18
 ICS H01L033-00
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
 Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08097519	A2	19960412	JP 1995-17327	19950203
	US 5657336	A	19970812	US 1995-508966	19950728
	US 5740193	A	19980414	US 1997-832065	19970402
PRAI	JP 1994-178773		19940729		
	JP 1995-17327		19950203		
	US 1995-508966		19950728		
AB	The electroluminescent devices have an n- and/or p-doped Group II-VI active layer (e.g., Cl- and/or N-doped ZnSe or ZnCdSe) between 1st and 2nd cladding layers . The Cl-contg. material used in doping may be ZnCl ₂ . The devices are useful as laser diodes and LEDs emitting blue or green light in room temp. and have a long life.				
ST	Group II chalcogenide electroluminescent device dopant; laser diode II VI dopant; LED II VI dopant				
IT	Group IIB element chalcogenides RL: DEV (Device component use); USES (Uses) (active layer ; Group II-VI EL devices with doped active layer for long life)				
IT	Electroluminescent devices (blue- or green-; Group II-VI EL devices with doped active layer for long life)				
IT	Lasers (semiconductor, blue- or green-; Group II-VI EL devices with doped active layer for long life)				
IT	1315-09-9, Zinc selenide 158346-21-5 , Zinc cadmium selenide RL: DEV (Device component use); USES (Uses) (active layer ; Group II-VI EL devices with doped active layer for long life)				
IT	7646-85-7, Zinc chloride, uses RL: TEM (Technical or engineered material use); USES (Uses) (dopant material; Group II-VI EL devices with doped active layer for long life)				
IT	7727-37-9, Nitrogen, uses 7782-50-5, Chlorine, uses RL: MOA (Modifier or additive use); USES (Uses) (dopant; Group II-VI EL devices with doped active layer for long life)				
IT	158346-21-5 , Zinc cadmium selenide RL: DEV (Device component use); USES (Uses) (active layer ; Group II-VI EL devices with doped active layer for long life)				
RN	158346-21-5 HCAPLUS				
CN	Cadmium zinc selenide (9CI) (CA INDEX NAME)				

Component	Ratio	Component Registry Number
Se	x	7782-49-2
Zn	x	7440-66-6
Cd	x	7440-43-9

L36 ANSWER 9 OF 11 HCAPLUS COPYRIGHT 2001 ACS
 AN 1996:396051 HCAPLUS
 DN 125:44782
 TI **semiconductor** electroluminescent devices using indium gallium
 nitride active **layer**
 IN Yagi, Katsumi; Kano, Takashi
 PA Sanyo Denki Kk, Japan
 SO Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM H01S003-18
 ICS H01L033-00
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related
 Properties)
 Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08064910	A2	19960308	JP 1994-198336	19940823
AB	The EL devices consist of a SiC substrate coated with a SiC 1st cladding layer , an InGaN active layer , and a SiC 2nd cladding layer . The active layer may consist of an alternate laminate of InGaN layers with low In compn. and gtoreq.1 InGaN layer with high In compn.				
ST	electroluminescent device indium gallium nitride; EL device indium gallium nitride; laser diode indium gallium nitride; LED indium gallium nitride blue; silicon carbide EL device laser				
IT	Electroluminescent devices (indium gallium nitride blue-emitting EL devices)				
IT	Lasers (semiconductor , indium gallium nitride blue-emitting EL devices)				
IT	120994-23-2, Gallium indium nitride ((Ga,In)N) 132238-81-4, Indium gallium nitride (In _{0.1} Ga _{0.9} N) 153439-80-6, Indium gallium nitride (In _{0.3} Ga _{0.7} N) RL: DEV (Device component use); USES (Uses) (active layer ; indium gallium nitride blue-emitting EL devices)				
IT	409-21-2, Silicon carbide, uses RL: DEV (Device component use); USES (Uses) (substrate and cladding layer ; indium gallium nitride blue-emitting EL devices)				
IT	120994-23-2, Gallium indium nitride ((Ga,In)N) 132238-81-4, Indium gallium nitride (In _{0.1} Ga _{0.9} N) 153439-80-6, Indium gallium nitride (In _{0.3} Ga _{0.7} N) RL: DEV (Device component use); USES (Uses) (active layer ; indium gallium nitride blue-emitting EL devices)				
RN	120994-23-2 HCAPLUS				
CN	Gallium indium nitride ((Ga,In)N) (9CI) (CA INDEX NAME)				

Component	Ratio	Component Registry Number
N	1	17778-88-0
In	0 - 1	7440-74-6
Ga	0 - 1	7440-55-3

RN 132238-81-4 HCAPLUS
 CN Gallium indium nitride (Ga0.9In0.1N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
In	0.1	7440-74-6
Ga	0.9	7440-55-3

RN 153439-80-6 HCAPLUS
 CN Gallium indium nitride (Ga0.7In0.3N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
In	0.3	7440-74-6
Ga	0.7	7440-55-3

L36 ANSWER 10 OF 11 HCAPLUS COPYRIGHT 2001 ACS
 AN 1996:396048 HCAPLUS
 DN 125:44779
 TI blue electroluminescent devices using gallium nitride compound
semiconductor
 IN Shakuda, Yukio
 PA Rohm Kk, Japan
 SO Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM H01L033-00
 ICS H01S003-18
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related
 Properties)

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08064870	A2	19960308	JP 1994-202477	19940826
	US 5825052	A	19981020	US 1995-515569	19950816
PRAI	JP 1994-202476		19940826		
	JP 1994-202477		19940826		
AB	The devices comprising n-type and p-type GaN-base semiconductor layers and a GaN-base semiconductor (N is substituted with P and/or As) light-emitting region.				
ST	electroluminescent device gallium nitride; EL device gallium nitride; LED gallium nitride phosphide antimonide				
IT	Electroluminescent devices (gallium nitride phosphide/antimonide EL devices with long emitting wavelength)				
IT	Group IIIA element pnictides RL: DEV (Device component use); USES (Uses) (gallium nitride phosphide/antimonide EL devices with long emitting wavelength)				
IT	121764-98-5, Gallium nitride phosphide (ganp) RL: DEV (Device component use); USES (Uses) (active layer ; gallium nitride phosphide/antimonide EL devices with long emitting wavelength)				

IT 106097-44-3, Aluminum gallium nitride ((Al,Ga)N)
 RL: DEV (Device component use); USES (Uses)
 (cladding layer; gallium nitride
 phosphide/antimonide **EL devices** with long emitting
 wavelength)

IT 7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7440-21-3,
 Silicon, uses 7440-41-7, Beryllium, uses 7440-43-9, Cadmium, uses
 7440-56-4, Germanium, uses 7440-66-6, Zinc, uses 7440-70-2, Calcium,
 uses 7704-34-9, Sulfur, uses 7782-49-2, Selenium, uses 13494-80-9,
 Tellurium, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (dopant in active layer; gallium nitride phosphide/antimonide
EL devices with long emitting wavelength)

IT 106097-44-3, Aluminum gallium nitride ((Al,Ga)N)
 RL: DEV (Device component use); USES (Uses)
 (cladding layer; gallium nitride
 phosphide/antimonide **EL devices** with long emitting
 wavelength)

RN 106097-44-3 HCAPLUS

CN Aluminum gallium nitride ((Al,Ga)N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
Ga	0 - 1	7440-55-3
Al	0 - 1	7429-90-5

L36 ANSWER 11 OF 11 HCAPLUS COPYRIGHT 2001 ACS

AN 1996:365327 HCAPLUS

DN 125:22020

TI gallium nitride-base blue electroluminescent devices and their manufacture

IN Shakuda, Yukio

PA Rohm Kk, Japan

SO Jpn. Kokai Tokkyo Koho, 6
 CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01S003-18
 ICS H01L033-00

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related
 Properties)

FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08064912	A2	19960308	JP 1994-202479	19940826
	US 5814533	A	19980929	US 1995-509231	19950731
PRAI	JP 1994-187341		19940809		
	JP 1994-196851		19940822		
	JP 1994-196853		19940822		
	JP 1994-202479		19940826		

AB The devices have GaN-base compd. **semiconductor layers**
 on a R face or a M face of a sapphire substrate. The
semiconductor layers may have (0001) side surface
 perpendicular to the substrate. The **semiconductor**
layers may including p-type and n-type layers,
 consisting of a buffer layer (n-GaN), a bottom **cladding**
layer (n-Al_xGa_{1-x}N, 0 < x < 1), an active layer
 (GaIn_{1-y}N, 0 < y < 1), a top **cladding layer**

(p-Al_xGa_{1-x}N, 0 < x < 1), and a cap **layer** (p-GaN). The active **layer** may have a pair of (0001) edge faces for light-emitting faces. The device **manuf.** involves laminating the **semiconductor layers** with lattice match on a R/M face of a sapphire substrate, etching the laminate along the (0001) face, forming electrodes on the cap **layer** and the developed buffer **layer**, and dicing into chips. The buffer **layer** may consist of a low temp.-depositing 1st **layer** and a high temp.-depositing 2nd **layer**. The devices show improved oscillation efficiency.

ST electroluminescent device gallium nitride sapphire; **EL device** gallium nitride sapphire; LED gallium nitride sapphire substrate; laser diode gallium nitride sapphire

IT Electroluminescent **devices**
(manuf. of gallium nitride **EL devices** on sapphire substrate)

IT Group IIIA element pnictides
RL: DEV (Device component use); USES (Uses)
(manuf. of gallium nitride **EL devices** on sapphire substrate)

IT Lasers
(**semiconductor**, manuf. of gallium nitride **EL devices** on sapphire substrate)

IT 120994-23-2, Gallium indium nitride ((Ga,In)N)
RL: DEV (Device component use); USES (Uses)
(active **layer**; manuf. of gallium nitride **EL devices** on sapphire substrate)

IT 25617-97-4, Gallium nitride
RL: DEV (Device component use); USES (Uses)
(buffer **layer** and cap **layer**; manuf. of gallium nitride **EL devices** on sapphire substrate)

IT 106097-44-3, Aluminum gallium nitride ((Al,Ga)N)
RL: DEV (Device component use); USES (Uses)
(**cladding layer**; manuf. of gallium nitride **EL devices** on sapphire substrate)

IT 1344-28-1, Aluminum oxide, uses
RL: DEV (Device component use); USES (Uses)
(manuf. of gallium nitride **EL devices** on sapphire substrate)

IT 120994-23-2, Gallium indium nitride ((Ga,In)N)
RL: DEV (Device component use); USES (Uses)
(active **layer**; manuf. of gallium nitride **EL devices** on sapphire substrate)

RN 120994-23-2 HCAPLUS

CN Gallium indium nitride ((Ga,In)N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
In	0 - 1	7440-74-6
Ga	0 - 1	7440-55-3

IT 106097-44-3, Aluminum gallium nitride ((Al,Ga)N)
RL: DEV (Device component use); USES (Uses)
(**cladding layer**; manuf. of gallium nitride **EL devices** on sapphire substrate)

RN 106097-44-3 HCAPLUS

CN Aluminum gallium nitride ((Al,Ga)N) (9CI) (CA INDEX NAME)

Component	Ratio	Component
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		Registry Number
N	1	17778-88-0
Ga	0 - 1	7440-55-3
Al	0 - 1	7429-90-5

L37 922 SEA FILE=WPIX ABB=ON PLU=ON (ELECTROLUMIN? OR EL) AND SEMICONDUCT?

L38 525 SEA FILE=WPIX ABB=ON PLU=ON ?LAYER? AND L37

L39 146 SEA FILE=WPIX ABB=ON PLU=ON (CNC OR ?CRYSTAL?) AND L38

L40 16 SEA FILE=WPIX ABB=ON PLU=ON ?DOPED AND L39

L41 9 SEA FILE=WPIX ABB=ON PLU=ON (ZN OR ZINC OR MG OR MAGNESIUM OR ALUMINIUM OR ALUMINUM OR AL OR GALLIUM OR GA) AND L40

=> d max 1-

YOU HAVE REQUESTED DATA FROM 9 ANSWERS - CONTINUE? Y/(N):y

L41 ANSWER 1 OF 9 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD

AN 2001-212813 [22] WPIX

DNN N2001-152036 DNC C2001-063597

TI **Semiconductor** device, e.g. **electroluminescent** display device, comprises three wirings, three insulating films, **semiconductor** film, and gate electrode.

DC L03 P81 P85 T04 U13 U14

IN ISOBE, A; SHIBATA, H

PA (SEME) SEL SEMICONDUCTOR ENERGY LAB; (SEME) SEMICONDUCTOR ENERGY LAB

CYC 27

PI EP 1081676 A1 20010307 (200122)* EN 38p G09G003-36

R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI

JP 2001144301 A 20010525 (200136) 19p H01L029-786

CN 1286493 A 20010307 (200140) H01L021-00

ADT EP 1081676 A1 EP 2000-118783 20000830; JP 2001144301 A JP 2000-253571 20000824; CN 1286493 A CN 2000-126319 20000830

PRAI JP 1999-246798 19990831

IC ICM G09G003-36; H01L021-00; H01L029-786

ICS G02F001-1343; G02F001-1345; G02F001-1362; G02F001-1368; H01L021-3205; H01L021-768; H01L021-822; H01L027-04; H04N005-66

AB EP 1081676 A UPAB: 20010421

NOVELTY - A **semiconductor** device comprises three wirings, three insulating films, a gate electrode and a **semiconductor** film. The second wiring and the gate electrode are connected to the first wiring on the second insulating film. The third wiring is connected to the **semiconductor** film on the third insulating film.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a method of manufacturing a **semiconductor** device comprising forming in sequence (i) the first wiring on a substrate (101) having an insulating surface, (ii) the first insulating film (103) on the first wiring, (iii) the **semiconductor** film (104) on the first insulating film, the second insulating film (105) on the **semiconductor** film, (iv) a first contact hole reaching the first wiring, (v) the gate electrode (106) on the second insulating film overlapping a portion of the **semiconductor** film and connected to the first wiring through the first contact hole, (vi) the third insulating film (108) on the gate electrode, (vii) a second contact hole (100a) reaching the **semiconductor** film, and (viii) the third wiring on the third insulating film connected to the **semiconductor** film through the second contact hole. The first contact hole is formed by selectively etching the first and second insulating films. The second contact hole is formed by selectively etching the second and third insulating films.

USE - As a **semiconductor** device, e.g. video camera, digital camera, projector, head-mount display, car navigation system, personal computer, information processing terminal or preferably an **electroluminescent (EL)** display device.

ADVANTAGE - The device does not require a sample hold capacitor in a portion of the peripheral circuit from the fact that the parasitic capacitance of the signal line increases, thus improving the holding characteristics of the signal line electric potential. The variations in the electric potential of the capacitor wiring caused by a writing-in electric current of a neighboring pixel can be avoided, thus obtaining satisfactory display images.

DESCRIPTION OF DRAWING(S) - The figure shows a cross-sectional structure of an active matrix type liquid **crystal** display device.

Contact hole 100a
Substrate 101
Scanning line 102
First insulating film 103
Semiconductor film 104
Second insulating film 105
Gate electrode 106
Third insulating film 108

Dwg. 4/19

TECH EP 1081676 A1 UPTX: 20010421

TECHNOLOGY FOCUS - ELECTRONICS - Preferred Components: A storage capacitor is formed with the second insulating film in a region where the second wiring and the **semiconductor** film overlap via the second insulating film. An impurity element imparting a conductivity type is **doped** into the region of the **semiconductor** film where the second wiring overlaps via the second insulating film. The device also comprises an electrode and a pixel electrode. The electrode is connected to the **semiconductor** film and the pixel electrode is connected to the electrode on the third insulating film. The first wiring is arranged orthogonal to the second or third wiring. The gate electrode is formed on a different **layer** from the first wiring. It is patterned into an island shape. The first wiring is a scanning line (102), the second wiring is a capacitor wiring, and the third wiring is a signal line. The second insulating film is a gate insulating film.

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Composition: The gate electrode comprises a film having a principal constituent which is polysilicon, tungsten, tungsten silicide, **aluminum**, tantalum, chromium or molybdenum; or a lamination film of a combination of these elements. The principal constituent has been **doped** with the impurity element.

FS CPI EPI GMPI

FA AB; GI

MC CPI: L03-G05A; L03-G05B; L04-C14A
EPI: T04-H03B; T04-H03C2A; U13-D03A; U14-H01A; U14-K01A2B

L41 ANSWER 2 OF 9 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD

AN 2000-239417 [21] WPIX

DNN N2000-179770 DNC C2000-073042

TI **Semiconductor** device having thin film transistor with lightly **doped** drain region has low density impurity region contacting channel formation region and high density impurity region contacting low density impurity region.

DC L03 U11 U12 U14

IN KUWABARA, H; NAKAJIMA, S; YAMAZAKI, S

PA (SEME) SEL SEMICONDUCTOR ENERGY LAB; (SEME) SEMICONDUCTOR ENERGY LAB

CYC 26

PI EP 989614 A2 20000329 (200021)* EN 30p H01L029-786

R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT
RO SE SI

JP 2000156504 A 20000606 (200035) 18p H01L029-786
ADT EP 989614 A2 EP 1999-117347 19990903; JP 2000156504 A JP 1998-251675
19980904

PRAI JP 1998-251675 19980904

IC ICM H01L029-786

ICS G09F009-33; H01L021-336

AB EP 989614 A UPAB: 20000502

NOVELTY - Gate insulating film contacts gate line formed on insulating surface. Channel region is formed over gate line with intervening gate insulating film. Low density impurity region contacts channel formation region. High density impurity region contacts low density impurity region. Organic resin **doped** with tri- or penta-valent impurity contacts protective film contacting channel formation region

DETAILED DESCRIPTION - The gate line has a single- or multi-layer structure and is made of an element selected from tantalum, copper, chromium, **aluminum**, molybdenum, titanium, and silicon or a material primarily constituted by silicon **doped** with a p-type or n-type impurity.

The tri- or penta-valent impurity is phosphorus or boron, respectively, and the density of the impurity in the organic resin is 1 multiply 10¹⁹ atoms/cm³.

The organic resin has photosensitivity.

A catalytic element comprising one or more of Ni, Fe, Co, Pt, Cu and Au, or preferably Ge or Pb, is included in the high density impurity region.

INDEPENDENT CLAIMS are given for:

(a) a **semiconductor** device based on that above and where a drain region is constituted by a first high density impurity region and a source region is constituted by a second high density impurity region formed on the other side of the channel formation region;

(b) a **semiconductor** device based on that above and where first and second low density impurity regions are in contact with the channel formation region, high density impurity region contacts the first and second low density impurity regions, and the widths of the first and second low density impurity regions are different in the direction of the channel length; and

(c) methods for manufacturing the **semiconductor** device.

USE - The **semiconductor** device includes a **semiconductor** circuit comprising a microprocessor, signal processing circuit or high frequency circuit, or comprises an electro-optical device, including a liquid **crystal** display, **EL** display, EC display or image sensor, or electronic equipment, including a video camera, digital camera, projector, goggle type display, navigation system, personal computer or personal digital assistant (all claimed).

ADVANTAGE - A lightly **doped** drain (LDD) region can be formed with fewer masks (maximum of seven masks) than required in the prior art process (minimum of eight masks). The design of a second mask is appropriately determined in accordance with requirements associated with the circuit configuration to make it possible to form a desired LDD region on both sides or one side of the channel formation region of a TFT. The **semiconductor** device can be manufactured with high mass productivity, reliability and reproducibility by very simple manufacturing steps.

DESCRIPTION OF DRAWING(S) - The drawing is a sectional view showing an example of a **semiconductor** device according to a first embodiment of the invention.

Substrate 100

Underlying film 101

Gate line 102

Gate insulating film 103
First and second protective films 108, 109
Masks 110a, 110b, 110c, 110d, 113b
Channel formation region 112
n+- type region 114
n-type region (LDD region) 115
p-type region 117
Layer insulating films 118, 125, 129
Extraction line 126

Lead line 127

Dwg.1/13

FS CPI EPI

FA AB; GI

MC CPI: L03-G05; L04-C02; L04-E01A; L04-E05; L04-E05A

EPI: U11-C04E1; U11-C18A3; U12-B03A; U12-D02A3; U14-K01A2B; U14-K01A5

DRN 1666-U

L41 ANSWER 3 OF 9 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD

AN 1999-526267 [44] WPIX

DNN N1999-389664 DNC C1999-154624

TI Ultra-thin **semiconducting** film production method, useful for making polymeric quinoline-based light emitting diodes.

DC E12 E24 L03 P54 U11 U12

IN PAPADIMITRAKOPOULOS, F

PA (UYCO-N) UNIV CONNECTICUT

CYC 1

PI US 5946550 A 19990831 (199944)* 19p H01L035-24

ADT US 5946550 A US 1997-818382 19970314

PRAI US 1997-818382 19970314

IC ICM H01L035-24

ICS B23B027-00; H01L033-00

AB US 5946550 A UPAB: 19991026

NOVELTY - Ultra-thin **semiconducting** films are generated by a self-assembly method in which elongated chains of metallo-bisquinoline chelates are formed in sequence on the surface of a substrate to give controlled development of film thickness, minimize contaminant entrapment and provide a pinhole-free structure.

DETAILED DESCRIPTION - A method for producing an ultra-thin **semiconducting** film comprises:

(a) contacting a substrate having a reactive functionalized surface with a divalent or trivalent chelating metal reagent;

(b) contacting the resultant metallo-functionalized surface with bisquinoline or a bisquinoline telomer to produce a deposit of an oligomeric metallo-bisquinoline chelate having the general formula (I) (from divalent cation) or (II) (from trivalent cation); and

(c) contacting this deposit with chelating metal reagent of (a), then with bisquinoline of (b), and repeating this step until the desired deposit thickness is obtained.

R = a group of formula (i) (attached at the bond marked asterisk).

USE - In the manufacture of **semiconducting** devices (claimed), particularly polymeric quinoline-based light emitting diodes, transistors and **electroluminescent** panels by means of self-assembly techniques.

ADVANTAGE - The method allows denser packing, direct chemical bonding to the substrate, high temperature stability and high uniformity of films and the construction of large size devices of varied shape and complexity, together with control of device color, structure and **crystallinity**.

DESCRIPTION OF DRAWING(S) - The drawing illustrates the growth of zinc bisquinoline chains in the self-assembly method.

Dwg.1/12

TECH US 5946550 A UPTX: 19991026

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Components: The substrate has a base and metallic oxide layer (doped with a fluorescent dye) and an interposed hole-transporting layer. The substrate is exposed to a hydroxyl, carboxyl, amino acid or thio compound (preferably concentrated sodium hydroxide solution). The chelating metal reagent is of formula (III) or (IV).

(CH₃-CH₂)_nMn (III)

MX_y (IV)

n = the valency of the metal; and

X = halogen or a carboxyl-containing ligand.

The chelating metal reagent is dissolved in an organic solvent and comprises a bisquinoline telomer with the chelating metal near the ends of the telomer chain.

Preferred Solvent: The chelating reaction is conducted in organic solvent (preferably tetrahydrofuran, benzene or toluene) or in water. Preferred

Conditions: Excess reactants are removed from substrate and deposits by cleaning the surface with solvent(s) between stages.

ABEX US 5946550 A UPTX: 19991026

EXAMPLE - Hydroxy-functionalized indium/tin oxide substrates were dipped in an organometallic solution of diethyl zinc in tetrahydrofuran (10⁻⁴ - 10⁻² molar concentration) for about 2 minutes. After rinsing in a THF bath, the organometallic functionalized surface was dipped in a THF solution of bisquinoline (10⁻⁴ - 10⁻² molar concentration) for a further 2 minutes, then rinsed with solvent. The controlled formation of layers effectively eliminated pinholes.

DEFINITIONS - Preferred Definitions:

M = zinc, beryllium, magnesium, aluminum, gallium or indium.

KW [1] 526-0-0-0 CL; 351-0-0-0 CL; 0006-64701 CL; 0006-64702 CL; 0006-64703 CL; 230836-0-0-0 CL PRD; 0006-64704 CL PRD; 230831-0-0-0 CL

FS CPI EPI GMPI

FA AB; GI; DCN

MC CPI: E05-B01; E05-D; E05-L03C; E05-L03D; E24-A03; E25-E01; E34-A; E34-B03; E35-C; E35-F; L03-C02C; L04-A04; L04-E01

EPI: U11-C01J5; U12-A01A1X

DRN 0659-U

CMC UPB 19991026

M3 *01* D023 D029 D621 D699 H4 H402 H442 H8 M1 M114 M280 M320 M412
M512 M520 M530 M540 M782 M904 M905 Q454 Q613 R023 R043
DCN: RA0N3L-K; RA0N3L-M

M3 *02* A430 A923 M210 M212 M250 M282 M320 M411 M510 M520 M530 M540 M620
M782 M904 M905 Q454 Q613 R023 R043
DCN: R05142-K; R05142-M

M3 *03* A313 A923 M210 M212 M250 M283 M320 M411 M510 M520 M530 M540 M620
M782 M904 M905 M910 Q454 Q613 R023 R043
DCN: R00659-K; R00659-M

M3 *04* A204 A212 A313 A331 A349 A430 A923 M210 M212 M250 M282 M283 M320
M411 M510 M520 M530 M540 M620 M782 M904 M905 Q454 Q613 R023 R043
DCN: 0006-64701-K; 0006-64701-M

M3 *05* A204 A212 A313 A331 A349 A430 A940 C000 C100 C730 C801 C803 C804
C805 C806 C807 M411 M782 M904 M905 Q454 Q613 R023 R043
DCN: 0006-64702-K; 0006-64702-M

M3 *06* A204 A212 A313 A331 A349 A430 A960 C710 J0 J011 J1 J171 M210
M211 M212 M213 M214 M215 M216 M220 M221 M222 M223 M224 M225 M226
M231 M232 M233 M262 M281 M320 M411 M510 M520 M530 M540 M620 M630
M782 M904 M905 Q454 Q613 R023 R043
DCN: 0006-64703-K; 0006-64703-M

M3 *07* A430 A960 C710 D023 D029 D621 D699 H4 H402 H442 H8 M1 M114

M280 M320 M411 M512 M520 M530 M540 M630 M720 M904 M905 N104 N209
 N253 N512 Q454 Q613 R043
 DCN: RA0N3Q-K; RA0N3Q-P

M3 *08* A204 A212 A313 A331 A349 A430 A960 C710 C801 C802 C803 C804 C805
 C806 C807 D023 D029 D621 D699 H4 H402 H442 H8 M1 M114 M280
 M320 M411 M512 M520 M530 M540 M630 M720 M904 M905 N104 N209 N253
 N512 Q454 Q613 R043
 DCN: 0006-64704-K; 0006-64704-P

M4 *07* A430 A960 C710 D023 D029 D621 D699 H4 H402 H442 H8 M1 M114
 M280 M320 M411 M512 M520 M530 M540 M630 M720 M904 M905 N104 N209
 N253 N512 Q454 Q613 R043 W002 W030 W335
 DCN: RA0N3Q-K; RA0N3Q-P

M4 *08* A204 A212 A313 A331 A349 A430 A960 C710 C801 C802 C803 C804 C805
 C806 C807 D023 D029 D621 D699 H4 H402 H442 H8 M1 M114 M280
 M320 M411 M512 M520 M530 M540 M630 M720 M904 M905 N104 N209 N253
 N512 Q454 Q613 R043 W002 W030 W335
 DCN: 0006-64704-K; 0006-64704-P

L41 ANSWER 4 OF 9 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD

AN 1989-008912 [02] WPIX

DNN N1989-006827 DNC C1989-004124

TI Thin film **electroluminescence** device - with good electro-optical
 characteristics and threshold voltage lower than 100 volts.

DC L03 Q71 U11 U14

IN GALLUZZI, F; ROMEO, N; SBERVEGLIE, G

PA (ENIE) ENIRICERCHE SPA; (ENIE) ENICHEM SPA

CYC 15

PI EP 297644 A 19890104 (198902)* EN 9p

R: AT BE CH DE ES FR GB GR LI LU NL SE

JP 01030197 A 19890201 (198911)

IT 1221924 B 19900823 (199217)

US 5107174 A 19920421 (199219) 6p

ADT EP 297644 A EP 1988-201182 19880609; JP 01030197 A JP 1988-161140
 19880630; IT 1221924 B IT 1987-21141 19870701; US 5107174 A US 1990-477119
 19900207

PRAI IT 1987-21141 19870701

REP 4. Jnl. Ref; A3...9028; EP 104846; EP 195395; No-SR. Pub

IC C23C014-34; F21K000-00; H01L021-20; H05B033-10; H05B033-26

AB EP 297644 A UPAB: 19930923

A thin film **electroluminescent** device comprises: (a) an
 amorphous support pref. glass or ceramic, on which are successively
 deposited; (b) a metal **layer** comprising 2 metals pref. selected
 from Pb, Sn, Bi, Sb, **Al**, **Ga**, Si, Ag, In, Au, having
 different melting points and capable of forming a homogeneous solid soln.
 with a **multicrystal** structure, with columnar (tabular) grains
 with average side dimensions equal to, or larger than, 1 micron, up to 500
 micron and thicker than 0.2 microns; (c) a luminescent **layer** of
Zn sulphide or **Zn** selenide **doped** with Mn and
 having the same structural characteristics except for thickness less than
 2 microns; (d) an insulating **layer** pref. one of Y2O3, Al2O3,
 SiN4, BaTiO3, PbTiO3, SrTiO3, greater than 0.2 microns thick; (e) a
 conductive **layer** pref. In2O3, SnO2, ITO, or ZnO, 0.1 micron
 thick. Pref. the metal **layer** is **Al**/Si, Pb/Sn,
Al/Ge, **Al**/Ga or Bi/Sn.

USE/ADVANTAGE - Process for preparing thin films, **crystalline**
 metals or **semiconductors** on amorphous substrates. Particularly
 suitable for **electroluminescence** devices incorporating a metal
layer and a luminescent **layer**, having good
 electro-optical characteristics and capable of emitting luminescence with
 threshold voltages lower than 100 V.

0/2

ABEQ US 5107174 A UPAB: 19930923

Thin film **electroluminescent** device comprises a) an amorphous support b) a binary alloy **layer** deposited on a); c) a luminescent **layer** deposited on **layer** b); d) an insulating **layer** deposited on **layer** c); and e) a conductive **layer** deposited on **layer** d). **Layer** b) further comprises two different metals, or a metal and a **semiconductor**. The two different metals, or the metal and the **semiconductor** i) have m.p.ts. different from one another and ii) can form a homogeneous solid soln. having a multi **crystal** structure having columnar grains. The length and width of the grains are not less than 1 micron and not more than 500 microns, and the depth of the grains is not less than 0.2 micron. **Layer** c) comprises a **layer** of zinc sulphide or zinc selenite, comprising manganese and having a multi **crystal** structure having columnar grains. The grains range in size from 1-500 microns and their depth is not more than 2 microns.

ADVANTAGE - New device has good electro-optical characteristics and a threshold voltage for luminescence below 100 volts.

FS CPI EPI GMPI

FA AB

MC CPI: L03-H04A

EPI: U11-C01A1; U11-C01J7; U11-C18B; U14-J

DRN 1515-U; 1520-U; 1531-U; 1544-U

L41 ANSWER 5 OF 9 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD

AN 1988-235903 [34] WPIX

DNN N1988-179203 DNC C1988-105571

TI Higher efficiency **electroluminescent layer** - contains mixed **crystals** of zinc-cadmium sulphide-selenide with compsn. which may vary through the **layer** thickness.

DC L03 U11 U14

IN MULLER, G O; MULLERMACH, R; REINSPERGE, G U

PA (DEAK) AKAD WISSENSCHAFTEN DDR

CYC 1

PI DD 255429 A 19880330 (198834)* 2p

ADT DD 255429 A DD 1986-298111 19861222

PRAI DD 1986-298111 19861222

IC H05B033-14

AB DD 255429 A UPAB: 19930923

The material, consisting of luminescent **semiconductor** **doped** with active luminescence centres, is sandwiched between insulator **layers** and electrodes. Its compsn. is $(\text{ZnxCd1-x})(\text{SySel-y})$ in which x is 0-1 and y is 0.4-1. The values of x and y can vary as a function of the depth in the **layer**. The dopants are pref. transition metals and/or stable molecules of transition metals and/or rare earth elements.

USE/ADVANTAGE - The material gives a brighter display due to an increase capture rate by luminescent centres. The **crystal** system gives a better opportunity for building in luminescent centres without causing **crystal** defects.

0/0

FS CPI EPI

FA AB

MC CPI: L03-G05; L03-H04A

EPI: U11-A09; U14-J

L41 ANSWER 6 OF 9 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD

AN 1988-228969 [33] WPIX

DNN N1988-174219 DNC C1988-102270

TI Vacuum vapour deposition of thin film using unsintered substrate - giving planar smooth film without particle scattering, useful in transistor and LED prodn..

AW LIGHT EMIT DIODE.

DC L03 U11 U14

IN HONDA, N

PA (NSMO) NISSAN MOTOR CO LTD

CYC 3

PI DE 3803189 A 19880811 (198833)* 5p
 JP 63190164 A 19880805 (198837)
 DE 3803189 C 19900208 (199006)
 US 4976988 A 19901211 (199101)
 JP 2529563 B2 19960828 (199639) 3p C23C014-30

ADT DE 3803189 A DE 1988-3803189 19880203; US 4976988 A US 1990-511970
 19900417; JP 2529563 B2 JP 1987-21780 19870203

FDT JP 2529563 B2 Previous Publ. JP 63190164

PRAI JP 1987-21780 19870203

IC C23C014-30; H01L021-28; H05B033-10
 ICM C23C014-30
 ICS H01L021-28; H05B033-10; H05B033-14

AB DE 3803189 A UPAB: 19970502

In vacuum vapour deposition of a thin film on a substrate by heating a sublimable source material (I) in vacuo, the novelty is that (I) is heated in vacuo in the unsintered state.

(I) is in **crystalline** or amorphous form and consists of a cpd. **semiconductor** of a gp. II and a gp. VI element. (I) is the source material for an **electroluminescent** phosphor, opt. in conjunction with an activator.

USE/ADVANTAGE - A planar thin film with a smooth surface can be obtd., without severe scattering of fine (I) particles in the vacuum chamber. The technique is useful in the prodn. of thin films of **ZnS**, **ZnSe**, **CdS** and **CaSe** used as thin film transistors or light-emitting films of thin film **electroluminescent** devices.

Dwg.1/3

ABEQ DE 3803189 C UPAB: 19930923

In the **layer** prodn. by electron beam evapn. of a sublimable source material (I), (I) used is an unsintered, **crystalline** source material produced by CVD. Pref. a II-VI junction semiconductor is used. Pref. an **electroluminescence**-fluorescent material (II) is used. Pref. simultaneously with (II), an activation agent is thermally vapour deposited.

ADVANTAGE - Undesired sputtering of solid fine particles of (I), in the vacuum chamber, is reduced.

ABEQ US 4976988 A UPAB: 19930923

A thin film of an **electroluminescent** phosphor (I) is deposited on a substrate. (I) is **ZnS doped** with a metal element that serves as an activator. Firstly, the substrate is placed in a vacuum chamber and there are separately placed in the chamber a) an unsintered **crystalline** mass of **ZnS**, prepd. by a chemical vapour deposition method, a Czochralski method, a floating zone method or a melting zone method, or a melting-solidifying method, and b) the metal element. The **crystalline** mass of **ZnS** is then heated by an electron beam in vacuum, thereby evaporating the **crystalline** mass of **ZnS**, whereby scattering of fine particles of **ZnS** is reduced. Finally, the metal element is heated in vacuum so as to evaporate the metal element, simultaneously with the evapn. of the **ZnS**.

ADVANTAGE - A thin film, having an even and smooth surface, can be deposited on a substrate, without serious influence of scattering of fine

particles of the source material in the vacuum chamber.
FS CPI EPI
FA AB; GI
MC CPI: L03-H04A; L04-E01A
EPI: U11-C01A1; U11-C01J7; U14-J

L41 ANSWER 7 OF 9 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 1978-19928A [11] WPIX

TI **Electroluminescent monocrystalline gallium**
nitride **semiconductor** - with partially compensated layer
below fully compensated active layer.

DC L03 U12

IN BOULOU, M; JACOB, G M

PA (PHIG) PHILIPS GLOEILAMPENFAB NV

CYC 7

PI DE 2738329 A 19780309 (197811)*
JP 53034486 A 19780331 (197819)
FR 2363900 A 19780505 (197822)
FR 2382103 A 19781027 (197848)
GB 1589351 A 19810513 (198120)
CA 1098609 A 19810331 (198121)
US 4268842 A 19810519 (198123)
JP 57035594 B 19820729 (198234)
IT 1084205 B 19850525 (198618)
DE 2738329 C 19880225 (198808)

PRAI FR 1976-26777 19760906; FR 1977-5770 19770228

IC H01L021-20; H01L031-12; H01L033-00

AB DE 2738329 A UPAB: 19930901

Electroluminescent semiconductor is based on a
monocrystalline substrate with an n-GaN **layer**; an active
GaN **layer doped** with a doping element for the
formation of acceptor impurities at least completely compensating the
natural donor impurities; a surface electrode in contact with the active
layer; and also provision for contacting the n-conductive
layer.

Improvement is that (part of) the n-conductive **layer**, which
is parallel to and bounds the active **layer**, is **doped**
for less than complete compensation of these doping elements, the net
concn. of the resultant impurities is small (pref. of the order of tenths
to millionths) w.r.t. the concn. of natural impurities and these are
almost homogeneous in the stated part of the **layer**.

The net concn. in the material can be varied during epitaxial growth
and more accurate and easily control is possible.

FS CPI EPI

FA AB

MC CPI: L03-D01D; L03-D04B

L41 ANSWER 8 OF 9 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD

AN 1977-18254Y [11] WPIX

TI Silicon carbide electro-luminescent diode - having linear dependence of
emission on current, and operating at very low temps..

DC L03 U12

PA (VALT-I) VALTER-MASLAKOVETS

CYC 1

PI CA 1006256 A 19770301 (197711)*

PRAI CA 1973-171957 19730522

IC H01L000-01

AB CA 1006256 A UPAB: 19930901

Semiconductor light source consists of (i) a N2-doped
n-type SiC **crystal** with an uncompensated majority donor concn.

of $(0.8-5) \times 10^{18}/\text{cc.}$; (ii) a p-n junction **electroluminescent** in the visible range; (iii) a p-layer 0.1-3 μ thick **doped** with $2 \times 10^{18}-2 \times 10^{20}/\text{cc.}$ acceptor impurities; (iv) a base layer in the SiC **crystal** having an uncompensated donor concn. of $(0.8-5) \times 10^{18}/\text{cc.}$; and (v) a central layer 0.05-1 μ thick between base and p-layers and **doped** with $(0.1-2) \times 10^{18}/\text{cc.}$ donor and acceptor luminescence activators. Resistivity of central layer is greater than base layer by ≥ 3 orders of magnitude.

The p-layer acceptor impurity is pref. Al or Ga; luminescence activators for donor type are pref. O and N, and of acceptor type are pref. B, or one of Be, Al, Ga and Sc.

Devices are used in visual displays, data recorders computers, display boards, digital instruments etc. They have a linear brightness-current characteristic, and operates at high current densities. They have low increase in forward voltage drop and low drop in radiation efficiency at ambient temps. down to -60 degrees C.

FS CPI EPI

FA AB

MC CPI: L03-D03E; L03-D04

L41 ANSWER 9 OF 9 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD

AN 1976-01250X [01] WPIX

TI **Electroluminescent semiconductor** device - with **doped** region provided with current conductor contg. tin-**doped** indium oxide layer.

DC L03 U12

PA (PHIG) PHILIPS GLOEILAMPENFAB NV

CYC 7

PI NL 7407812 A 19751216 (197601)*10

DE 2523963 A 19760102 (197601)

FR 2275031 A 19760213 (197614)

CH 588168 A 19770531 (197727)

GB 1503545 A 19780315 (197811)

CA 1030643 A 19780502 (197820)

IT 1038801 B 19791130 (198011)

PRAI NL 1974-7812 19740612

IC H01L033-00

AB NL 7407812 A UPAB: 19930901

Electroluminescent semiconductor device has a **monocrystalline semiconductor** body of a III-V cpd., e.g. gallium arsenide phosphide, contg. ≥ 1 doping region that forms an **electroluminescent** pn-transition with the adjoining material of the **semiconductor** body, and is provided with a current conductor contg. a tin-**doped** indium oxide layer. The conductor has an acceptable transparency, and low lateral resistance. Homogeneous emission of radiation over the whole **doped** region is obtd. Process is simple and cheap.

FS CPI EPI

FA AB

MC CPI: L03-D04B

L37 922 SEA FILE=WPIX ABB=ON PLU=ON (ELECTROLUMIN? OR EL) AND SEMICONDUCT?
 L43 9592 SEA L37
 L44 3730 SEA ?LAYER? AND L43
 L45 82 SEA L44 AND (CNC OR NANOCRYSTAL?)
 L46 14 SEA (P-DOP? OR DOP?) AND L45
 L47 4 SEA L46 AND (ZN OR ZINC OR MG OR MAGNESIUM OR ALUMINIUM OR ALUMINUM OR AL OR GALLIUM OR GA)

=> d all 1-4

L47 ANSWER 1 OF 4 INSPEC COPYRIGHT 2001 IEE
 AN 1999:6361445 INSPEC DN A1999-21-6146-012
 TI Ion beam synthesis of compound nanoparticles in SiO₂.
 AU Perez-Rodriguez, A.; Garrido, B.; Bonafos, C.; Lopez, M.; Gonzalez-Varona, O.; Monrante, J.R. (Dept. d'Electron., Barcelona Univ., Spain); Montserrat, J.; Rodriguez, R.
 SO Journal of Materials Science: Materials in Electronics (July 1999) vol.10, no.5-6, p.385-91. 22 refs.
 Published by: Kluwer Academic Publishers/Chapman & Hall
 Price: CCCC 0957-4522/99/\$15.00
 CODEN: JSMEEV ISSN: 0957-4522
 SICI: 0957-4522(199907)10:5/6L:385:BSCN;1-X
 Conference: 2nd International Conference on Materials for Microelectronics. Bordeaux, France, 14-15 Sept 1998
 DT Conference Article; Journal
 TC Practical; Experimental
 CY United States
 LA English
 AB The ion beam synthesis of group IV (SiC) and II-VI (ZnS) compound nanoparticles in SiO₂ **layers** is studied. These systems are potentially interesting for optoelectronic applications such as **electroluminescent** devices emitting in the visible and UV range. The combination of structural (transmission electron microscopy, electron and X-ray diffraction), optical (infrared and raman spectroscopies, optical absorption and photoluminescence) and physico-chemical (X-ray photoelectron spectroscopy, secondary ion mass spectroscopy) techniques have been used to identify the phases formed and to correlate the optical behaviour of the **layers** with their microstructure. The first part is dedicated to the synthesis of luminescent SiO₂ **layers** co-implanted with Si and C. The presence of regions with different composition in terms of C content gives rise to the formation of 3 types of nanoparticles (Si, C and SiC) leading to three intense, simultaneous and independent emission bands covering the whole visible range. A second part is dedicated to the synthesis of **Mn doped ZnS nanocrystals**. We have succeeded in synthesizing **ZnS nanocrystals** by sequential ion implantation in SiO₂. The structural characterization of the annealed **layers** shows **ZnS** precipitates having a wurtzite-2H structure and with a quite narrow distribution of sizes. This population of **nanocrystals** is organized in two **layers** parallel to the free surface, as a consequence of a pure Ostwald ripening process or as a result of the implantation damage distribution. The optical analysis of samples co-implanted with Mn shows the presence of a yellow-green and intense photoluminescence corresponding to an intra-Mn²⁺ transition, which demonstrates the effective **doping** with Mn of the **ZnS** precipitates.
 CC A6146 Structure of solid clusters, nanoparticles, and nanostructured materials; A7125W Electronic structure of solid clusters and

nanoparticles; A6180J Ion beam effects; A7860F Electroluminescence (condensed matter); A7830G Infrared and Raman spectra in inorganic crystals; A7840H Visible and ultraviolet spectra of other nonmetals; A7855H Photoluminescence in other inorganic materials

CT **ELECTROLUMINESCENCE**; ELECTRON DIFFRACTION; INFRARED SPECTRA; ION BEAM EFFECTS; NANOSTRUCTURED MATERIALS; PHOTOLUMINESCENCE; RAMAN SPECTRA; **SEMICONDUCTOR DOPED GLASSES**; SILICON COMPOUNDS; TRANSMISSION ELECTRON MICROSCOPY; VISIBLE SPECTRA; X-RAY DIFFRACTION; X-RAY PHOTOELECTRON SPECTRA

ST ion beam synthesis; compound nanoparticles; SiO₂; optoelectronic applications; **electroluminescent devices**; visible; UV range; transmission electron microscopy; X-ray diffraction; electron diffraction; infrared spectra; Raman spectra; optical behaviour; emission bands; wurtzite-2H structure; free surface; implantation damage distribution; pure Ostwald ripening process; optical analysis; **effective doping**

CHI SiO₂ bin, O₂ bin, Si bin, O bin

ET O*Si; SiO₂; Si cp; cp; O cp; C*Si; SiC; C cp; S*Zn; ZnS; Zn cp; S cp; Si; C; Mn; H; Mn²⁺; Mn ip 2; ip 2; SiO; O

L47 ANSWER 2 OF 4 INSPEC COPYRIGHT 2001 IEE

AN 1999:6204270 INSPEC DN A1999-09-7865K-023; B1999-05-4260-012

TI **Electroluminescence** and cathodoluminescence from inorganic CdSe **nanocrystals** embedded in thin films.

AU Mattoussi, H. (Dept. of Mater. Sci. & Eng., MIT, Cambridge, MA, USA); Rodriguez-Viejo, J.; Jensen, K.F.; Bawendi, M.G.; Rubner, M.F.

SO Proceedings of the SPIE - The International Society for Optical Engineering (1998) vol.3476, p.310-21..32 refs.
Published by: SPIE-Int. Soc. Opt. Eng
Price: CCCC 0277-786X/98/\$10.00
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1998)3476L:310:ECFI;1-E
Conference: Organic Light-Emitting Materials and Devices II. San Diego, CA, USA, 21-23 July 1998
Sponsor(s): SPIE

DT Conference Article; Journal

TC Practical; Experimental

CY United States

LA English

AB **Electroluminescence (EL)** from heterostructure devices made of organic poly (phenylene vinylene), PPV, and inorganic **semiconductor CdSe nanocrystals** have been investigated, along with cathodoluminescence (CL) from thin films of **ZnS doped with CdSe-ZnS core-shell nanocrystals**. In the **EL** devices, the organic PPV structure, built next to the anode using the technique of molecular **layer-by-layer** sequential adsorption, serves as the hole transport **layer**. The inorganic **layer**, adjacent to the electrode and made of spin cast CdSe **nanocrystals** passivated with either organic groups or with a thin **layer** of **ZnS**, is the emitting **layer**. The **ZnS** host film in the CL devices, built using chemical vapor deposition, serves as the support medium for the dispersed **nanocrystals**, but also provides additional passivation to the surface of those **nanocrystals**. We find that the **EL** and CL signals almost exclusively originate from the inorganic **nanocrystal** in both cases, i.e., **EL** comes from the **nanocrystal layer** in the heterostructure device while CL is generated from the dispersed particles in the composite film. The external **EL** quantum efficiency, η_{EL} , is not enhanced by the presence of **ZnS** overcoating, opposed to the observed increase in the photoluminescence (PL) quantum yield. However, we

find that the CL emission and its stability are substantially improved by the presence of **ZnS** around the emitting **nanocrystal** cores. These observations reflect a difference in the effects of overcoating on the various luminescence processes. On the one hand, a **ZnS** overlayer is associated with an additional energetic barrier that reduces the efficiency of charge injection into the **nanocrystals** for **EL**. On the other hand, PL and CL processes only benefit from the surface passivation with **ZnS**.

CC A7865K Optical properties of III-V and II-VI semiconductors (thin films/low-dimensional structures); A7855E Photoluminescence in II-VI and III-V semiconductors; A7320D Electron states in low-dimensional structures; A7860F Electroluminescence (condensed matter); A7860H Cathodoluminescence, ionoluminescence (condensed matter); B4260 Electroluminescent devices; B2520D II-VI and III-V semiconductors

CT CADMIUM COMPOUNDS; CATHODOLUMINESCENCE; **ELECTROLUMINESCENCE**; II-VI **SEMICONDUCTORS**; NANOSTRUCTURED MATERIALS; POLYMER FILMS; **SEMICONDUCTOR QUANTUM DOTS**

ST **electroluminescence**; cathodoluminescence; **CdSe nanocrystals**; poly (phenylene vinylene); **molecular layer-by-layer sequential adsorption**; **hole transport layer**; **dispersed nanocrystals**; photoluminescence; quantum yield; **ZnS overlayer**; additional energetic barrier; surface passivation; **CdSe**; **ZnS**

CHI CdSe int, Cd int, Se int, CdSe bin, Cd bin, Se bin; ZnS int, Zn int, S int, ZnS bin, Zn bin, S bin

ET Cd*Se; Cd sy 2; sy 2; Se sy 2; CdSe; Cd cp; cp; Se cp; S*Zn; ZnS; Zn cp; S cp; Cd*S*Se*Zn; Cd sy 4; sy 4; S sy 4; Se sy 4; Zn sy 4; CdSe-ZnS; Cd; Se; Zn; S

L47 ANSWER 3 OF 4 INSPEC COPYRIGHT 2001 IEE

AN 1998:6076796 INSPEC DN A9824-7860F-004; B9812-4220-009

TI Photoluminescence and **electroluminescence** from copper **doped zinc sulphide nanocrystals/polymer composite**.

AU Que, W.; Zhou, Y.; Lam, Y.L.; Chan, Y.C.; Kam, C.H. (Sch. of Electr. & Electron. Eng., Nanyang Technol. Inst., Singapore); Liu, B.; Gan, L.M.; Chew, C.H.; Chua, S.J.; Xu, S.J.; Mendis, F.V.C.

SO Applied Physics Letters (9 Nov. 1998) vol.73, no.19, p.2727-9. 29 refs. Doc. No.: S0003-6951(98)03544-X
Published by: AIP
Price: CCCC 0003-6951/98/73(19)/2727(3)/\$15.00
CODEN: APPLAB ISSN: 0003-6951
SICI: 0003-6951(19981109)73:19L:2727:PEFC;1-F

DT Journal

TC Practical; Experimental

CY United States

LA English

AB **Cu-doped ZnS nanocrystals** were prepared in an inverse microemulsion at room temperature as well as under a hydrothermal condition. X-ray diffraction analysis showed that the diameter of the **Cu-doped ZnS nanocrystals** particles was about 9 nm. These particles showed a strong photoluminescence intensity and a broad emission band from 490 to 530 nm. The half-width of emission was about 60 nm. **Cu-doped ZnS nanocrystals/polymethylmethacrylate composite** as a light-emitting layer was used to fabricate a single layer structure **electroluminescent** device which had low turn on voltage (less than 5 V). The green light of **electroluminescence** was observed at room temperature. The **electroluminescence** and photoluminescence spectra were nearly identical at room temperature.

CC A7860F Electroluminescence; A6146 Solid clusters (including fullerenes) and nanoparticles; A6480G Microstructure; A7855D Photoluminescence in tetrahedrally bonded nonmetals; A8270K Emulsions and suspensions; A8120T Preparation of reinforced polymers and polymer-based composites; B4220 Luminescent materials; B4260 Electroluminescent devices; B0550 Composite materials (engineering materials science)

CT COPPER; **ELECTROLUMINESCENCE**; **ELECTROLUMINESCENT** DEVICES; FILLED POLYMERS; II-VI **SEMICONDUCTORS**; MICROEMULSIONS; NANOSTRUCTURED MATERIALS; OPTICAL POLYMERS; PARTICLE SIZE; PHOTOLUMINESCENCE; SPECTRAL LINE BREADTH; SPECTRAL LINE INTENSITY; **ZINC COMPOUNDS**

ST photoluminescence; **electroluminescence**; **copper doped zinc sulphide nanocrystals/polymer composite**; **Cu-doped ZnS nanocrystals**; inverse microemulsion; room temperature; hydrothermal condition; X-ray diffraction; strong photoluminescence intensity; broad emission band; half-width; polymethylmethacrylate composite; **light-emitting layer**; **single layer structure** **electroluminescent device**; low turn on voltage; green light; 9 nm; 490 to 530 nm; 5 V; 20 C; **ZnS:Cu**

CHI ZnS:Cu int, ZnS int, Cu int, Zn int, S int, ZnS:Cu ss, Cu ss, Zn ss, S ss, ZnS bin, Zn bin, S bin, Cu el, Cu dop

PHP size 9.0E-09 m; wavelength 4.9E-07 to 5.3E-07 m; voltage 5.0E+00 V; temperature 2.93E+02 K

ET Cu; S*Zn; ZnS; Zn cp; cp; S cp; Cu*S*Zn; Cu sy 3; sy 3; S sy 3; Zn sy 3; ZnS:Cu; Cu doping; doped materials; Zn; S

L47 ANSWER 4 OF 4 INSPEC COPYRIGHT 2001 IEE

AN 1996:5336577 INSPEC DN B9609-4260D-010

TI Fabrication and characteristics of **ZnS nanocrystals** /polymer composite **doped** with tetraphenylbenzidine single **layer** structure light-emitting diode.

AU Yi Yang; Shanhua Xue; Shiyong Liu (Lab. of Nat. Integrated Optoelectron., Jilin Univ., Changchun, China); Jinman Huang; Jiacong Shen

SO Applied Physics Letters (15 July 1996) vol.69, no.3, p.377-9. 24 refs. Doc. No.: S0003-6951(96)01029-7
Published by: AIP
Price: CCCC 0003-6951/96/69(3)/377/3/\$10.00
CODEN: APPLAB ISSN: 0003-6951
SICI: 0003-6951(19960715)69:3L:377:FCNP;1-Y

DT Journal

TC Experimental

CY United States

LA English

AB The hexagonal **ZnS nanocrystals** were synthesized in polymer matrix. The **ZnS** polymer composite **doped** with tetraphenylbenzidine (TPB) as **light-emitting layer** was used to fabricate a single **layer** structure light-emitting diode which has a low turn on voltage such as 2.5 V. The **electroluminescence** spectrum was obtained at room temperature. Owing to the effect that TPB interacted with **ZnS nanocrystal** to form the luminescent center, the emission was peaking at 520 nm which shifts to the lower energy compared with that of **ZnS**, and the half-width of the emission was about 20 nm.

CC B4260D Light emitting diodes

CT **ELECTROLUMINESCENCE**; II-VI **SEMICONDUCTORS**; LIGHT EMITTING DIODES; NANOSTRUCTURED MATERIALS; **SEMICONDUCTOR QUANTUM DOTS**; **ZINC COMPOUNDS**

ST **ZnS nanocrystals/polymer:tetraphenylbenzidine composite**; **single layer structure light-emitting diode**; **electroluminescence spectrum**; emission half-width; 2.5 V; 520 nm;

ZnS

CHI ZnS int, Zn int, S int, ZnS bin, Zn bin, S bin
PHP voltage 2.5E+00 V; wavelength 5.2E-07 m
ET S*Zn; ZnS; Zn cp; cp; S cp; Zn; S